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A table of contents for *Bibliotheca Sacra* can be found here:

# ARTICLE VI.

## RELATIONS OF THE ARYAN AND SEMITIC LANGUAGES.

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### IV. — MORPHOLOGY OF ROOTS.

In our last Article it was shown that the primitive stock of sounds was the same in the Aryan and the Semitic families of speech. These sounds were the following: $-$ (spiritus lenis, Aleph, Hamza), $k$, $t$, $p$, $g$, $d$, $b$, $y$, $v$, $r$ $(l)$, $s$, $m$, $n$; $a$, $i$, $u$.[1] Any verbal forms in these languages that are to be compared must first be reduced to these simple phonetic elements. It was also stated [2] that there were two principles which must determine the choice of comparable forms; first, the primary signification of each must be shown to be the same; secondly, each term to be compared must be reduced to the form it possessed before the system of speech containing it (Proto-Semitic or Proto-Aryan) became broken up into different dialects. Keeping these principles in view, we have to proceed to an analysis and comparison of the words in the two systems that seem worthy hypothetically of such treatment. It will be necessary, however, to begin the investigation by showing how we are to deal with the living elements of language, whose seemingly endless diversity would appear to forbid any attempt to harmonize them. In both districts of speech, and especially in the Semitic, we seem to be wandering about in a vast wilderness, through which the explorer moves in a hopeless entanglement of bewilderment and confusion, never reaching a meeting-place for the paths that either lead no-whither, or cross one another perpetually, without beginning and without end. It will be needful to show that some central elevation may be gained from which we may look down upon this " mighty

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[1] Bib. Sac., Oct. 1879, p. 704 ff.      [2] Ibid., p. 686.

maze," and see that it is " not without a plan " ; from which we shall be able to see that the paths which are interrupted by so many obstacles, interposed by the careless ages, still keep on their course, whether converging or diverging, and run from side to side of the great wilderness. In plainer language, it will be incumbent on us, knowing how the current terms of each idiom may be referred to their proper stems, and further to their conventional so-called roots, to show according to what laws of formation the " roots " themselves may be analyzed into their simplest expressions.

A root has been well defined by Curtius as " the significant combination of sounds which remains when everything formative and accidental has been stripped away from a given word." [1] In inflectional languages, at least, such so-called roots do not appear clearly at the first showing ; and the only way of arriving at them is obviously to make sure that the forms to be examined are primary and not derivative, and then by a thorough analysis of them, with a careful application, if need be, of the known phonetic laws of the language in question, to eliminate in each case the invariable significant term from the variable and unessential suffix, prefix, or infix. When this is done, however, we find that in many cases the process of analysis is not fairly complete. In both great families of speech there are found multitudes of similar roots, with similar meanings, whose relations to one another it is the duty of students to determine. In harmony with what we would naturally suspect with regard to the growth of living speech, it is found that the primitive stock of roots at the command of the earliest speakers was enlarged according to need by internal changes or external additions. The inflective or formative elements are seen to be attached with equal freedom and regularity to all these variant similar forms, showing that these forms are independent of one another. This is not the proper place for an extended exhibition of the evidence in favor of such a

[1] Grundzüge d. griechischen Etymologie (5th ed., 1879), p. 45 ; cf. p. 43 f., or in the English translation (4th ed. London, 1875, 1876), Vol. i. p. 58 ; cf. 55 f.

doctrine. We shall presently have to cite groups of words in each family that will illustrate the position here assumed. Meanwhile, it will be enough to say that a twofold distinction has to be made with regard to the forms under discussion; and that by the common consent, if not always by the verbal agreement, of leading etymologists. First, we must distinguish *secondary* from *primary* roots, or discriminate forms that seem to have been developed out of earlier ones from those which we cannot reduce to prior conditions. Secondly, we must note a difference between *absolute* and *relative* roots [1]; remembering that in many cases analysis brings us at last to forms which it is impossible to regard as the exact ultimate expression of the radical idea; since, for example, the combinations arrived at are sometimes unpronounceable, and sometimes appear in a slightly different form in different dialects of the same family. This latter distinction, however, is evidently not to be made use of practically, and must only be kept in mind as a constant warning against the temptation to fancy that we can always succeed in harmonizing the form and substance of language according to their original identity. But the principle of the existence of both primary and secondary roots is of vital importance in glottological research, and most of what we have yet to say will be simply an attempt to trace its manifestations in Aryan and Semitic speech.

We shall first deal with the current roots of the Aryan family. The discussion of this subject will be necessarily short; and the reader is referred for a full presentation of all sides of the question to what has been written by such eminent etymologists as Pott,[2] Curtius,[3] and Fick.[4] We

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[1] This distinction, adopted by Curtius, was first made in these terms by Pott. Etymologische Forschungen (2d ed.), Vol. ii. p. 246.

[2] Etymologische Forschungen (2d ed.), Vol. ii. p. 225 ff.

[3] Op. cit , pp. 31–70, English translation, pp. 40–90.

[4] Vergleichendes Wörterbuch d. indogermanischen Sprachen(3d ed., 1874–76), Vol. iv. pp. 1–120. This acute and ingenious etymologist attempts to show at length that Indo-European ultimate roots fall under three classes : 1. those which consist of a mere vowel (*a, i, u*) ; 2. those formed of the vowel *a* + a

shall give here the principles which seem to be most surely established with regard to the verbal or predicative roots. Those who are familiar with the late ingenious theorizing on the subject will see that we hold a position as conservative as is possible to any one not belonging to that obstructive sect of glottologists who refuse to analyze the current roots of any system of speech on the ground that there was no development within that sphere of language.

In analyzing the Indo-European roots we must have regard to a distinction which divides them into two great classes. We must distinguish between those forms in which new elements have been added to the old, and those in which the old have been simply modified. Both of these processes of change or development were energetically carried on, after the breaking up of the Aryan household, in every branch of the family; but their operation may also be traced more or less clearly within that stock of root-forms which was the linguistic property of all in common.

First, as to the development of new roots through modification of the old, without addition. Here we have independent Indo-European roots arising,

(1) Through the weakening of a vowel in the original form. Thus a radical *a* is weakened to *i*, as the root *dik*, to show, is clearly from the stronger *dak* (as found in διδάσκω and *doceo*); *di*, to divide, from *da*; *pi*, to drink, from *pa*.

consonant (as *ad, ap, as*); 3. those made up of a consonant or double consonant + the vowel *a* (*da, pa, su, sta, spa, sma*). We have space for only two or three brief criticisms of this theory. First, to be formally accurate, classes one and three ought to be brought together. No root, and, in fact, no independent articulate sound can consist of a vowel alone; the spiritus lenis preceding the vowel sound is a consonant. Second, the universal elimination of *i* and *u* from classes two and three does not seem justified by the examples given. There are some roots in which these sounds cannot be shown to be secondary; e.g. in *di* to hasten, *pri* to love, *di* to shine, the *i* cannot easily be reduced to *a*; nor can a like origin be found for the *u* in *su* to beget, *bhu* to be, *ru* (*lu*) to separate, or *yu* to join. Third, there are many cases in which a vowel cannot be shown to have been the original closing sound; thus, *mar* to rub, grind, in which the notion of physical action is inherent, is probably not developed, as Fick claims, from *ma*, to diminish; nor can an earlier vowel-ending root be well found for *vas* (*us*) to burn, *spak* to see, *bhar* to bear, *vid* to know, *yaj* to honor.

Less frequently, but as clearly, *a* is obscured into *u*, as in *mud*, to be lively, compared with *mad* ; *bhuj*, to enjoy, share in (*fungor*), as related to *bhaj* (ἔ-φαγ-ον).

(2) Through the intensification or strengthening of a vowel sound. To this influence, and not to the introduction of a new vocal element, we must ascribe such developments as that of *div* (*dyu*), to shine, from *du*, to burn (δαίω for δα F-ίω) ; and *siv*, to sew, from *su*.

(3) Through the transposition of sounds. The only cases in which this has probably occurred are a few in which *r* is one of the sounds ; thus *arg*, to be bright, has become *rag*, to color ; and *arbh* (ἀλφ-αίνῳ), to obtain, has changed into *rabh* (λαμβ-άνω), to take hold of.

In these classes we can appeal with confidence to established laws of phonetic change, if we wish to determine, in any given case, which of the double or multiple forms is the earliest.

Secondly, we must consider those roots which differ from similar ones by the possession of additional elements.

(1) We find the additional factor at the beginning of the form. The only sound that seems to play this part in the Indo-European is *s*. Its occurrence there is limited to a few cases ; though in the subsequent divided life of its several dialects such a use or disuse of *s* became much more common. The root *nu*, to float, is clearly Proto-Aryan ; but so also is the kindred *snu*. The root *stan*, to sound, was also heard along with the related *tan*, to stretch, just as στόνος is found in Greek in company with τόνος.

There seems to be no good reason to suppose that new Indo-European roots were ever developed by the infixing of a new sound in the old. The only sound for which such a function can be claimed plausibly is *n*. But if we examine all the forms in which this additional sound occurs, it will be found that the two hypothetical roots are not used independently of one another to form separate verbal and nominal stems, but occur side by side as the basis of derivatives that evidently spring from the same source. They are thus shown

to be variations of one another, rather than distinct roots with a separate range of development and an appreciable difference of meaning. Thus the root *agh*, to press, compress, is evidently the same as *angh;* for while the former appears in the nearest Sanskrit derivative, *agha*, oppressing, evil, or as substantive, affliction, sin, as well as in the hometymous [1] words ἄχος, grief; ἔχις (= constrictor, the Sanskrit *ahi*), serpent, and the Sanskrit *ahṅ*, narrow, the latter is as evident in the corresponding Sanskrit, *aṅhas*, affliction, sin ; the Latin *anguis*, serpent, as well as in *angustus*, narrow, and the German *eng; angor, anxius*, and the Germ. *angst*. This we give as a fair specimen of the whole class, and accordingly assume for the Indo-European system, that the insertion of an *n* sound is nothing more than the nasalization of the preceding vowel, rather accidental than essential to the autonomy of the root. It is, in fact, a phenomenon similar in origin to the epithetic ν in Greek (ἔλεγεν < ἔλεγε), the nunnation in Arabic, and the mimmation in Assyrian, and does not correspond to an additional etymological element. On the other hand, it is probable that in many cases the *n* was heard in the original root, and the form containing it would have to be regarded as the earlier one, from which the other arose through the weakening of the sound by denasalization, till it disappeared entirely in some of the forms; though within the Indo-European sphere this process gave rise to no new roots, in the strict sense of this term.[2]

[1] This much needed term, with the corresponding "hometymon," the writer owes to the invention of Mr. S. R. Winans of Princeton College, his friend and companion in philological studies.

[2] We must be careful in this, as in all other cases coming under our general survey, to distinguish between roots which a comparison of various dialects shows clearly to have been Proto-Aryan, and those which are found in an altered form in one or more of the dialects as later developments, evolved after the breaking up of the family. Thus *jung*, to join, is a special Latin root, but if we compare it with the Greek ζευγ- (ζυγ), and the Sanscrit *yuj*, as seen in ζεύγνυμι and *yunajmi*, we see that it arises only from the transposition of the formative *n*. In reading Curtius' admirable treatment in his Grundzüge, of the subject of primary and secondary roots (which he has modified on some points in the 5th ed., of 1879), the reader should keep in mind that although much of what he says applies to Indo-European roots, his main purpose is the analysis of those peculiar to the Greek.

(2) We have the most important class of root-distinctions in those forms which differ from similar ones in having the additional sound at the end. These sounds, which are quite various and usually distinguishable with clearness, have been named by Curtius [1] root-determinatives. This term, which would properly indicate a radical *significant* element, we shall adopt throughout this discussion as applying to any additional sound in either family, under the guise of a prefix, infix, or suffix, which is not a mere expansion or strengthening of the root, or a mere unessential variation of a previously existing element through ordinary laws of phonetic change. The justness of this comprehensive distinction we shall show by-and-by. Here it is in order to enumerate the letters that seem to play this part at the end of Indo-European roots.

The only vowel that appears as a post-determinative in undoubted Indo-European roots is *a*, which is found in a few secondary forms, as *dhya*, to see, from *dhi*; *gna*, to know, from *gan*, (Eng., *ken*).

As to the determinative consonants, taking them in the order of the Sanskrit alphabet, we have first [2] *k*, which appears to us as certain only in the roots *mark*, to touch, stroke, (*mulc-ere*), as compared with *mar*, to rub; *dark*, to see, as related to *dar*, (Sanskrit and Lithuanian); *dak*, to bite, as compared with *da*, to divide, tear (whence *da-nt*, *tooth*,); *bhark*, to shine, (φορκός, *bright*), as related to *bhar*, itself a very early development from *bha*. It appears, moreover, at the end of many lengthened onomatopoetic roots, whose etymological relations are, of course, not so clearly definable.

*g* appears as a determinative in *yug*, to join, as compared with *yu*; *marg*, stroke, wipe (ο-μόργ-νυμι, *milk*), as related with *mar*; *bharg*, to shine (φλέγω, *flag-ro*, *bleach*), in connection with *bhar*, and a few others. Fick, in his discussion of these points,[3] calls attention to the existence of so many

[1] In Kuhn's Zeitschrift für vergl. Sprachforschung, Vol. iv. 211 ff. See his Grundzüge (5th ed., 1879), p. 69; English translation (of 4th ed.), p. 89.

[2] Fick, op. cit., iv. p. 51 ff., cites a large number of supposed cases for a determinative *k*, but most of these seem to rest on no sure etymological foundation.

[3] Op. cit., iv. p. 58 ff.

roots that differ from similar forms only in having *g* instead of *k* at the end, and assumes that *g* in such cases is only a weakening of *k*. This is hardly probable. We find no such regular concurrence of *p* and *b* in secondary forms, nor of *d* and *t*; and it is not likely that *k* alone of the hard mutes would thus be softened. *g* is also an independent Indo-European sound, of at least as much radical importance as *k*. It seems best, therefore, to assume that the affinity of the ideas to be expressed, was conveyed to the ear by the employment of similar sounds.

Out of the many cases cited by Fick [1] in which *gh* is supposed to be a determinative, we can regard as well established only *dhargh* (Eng. *drag*), as related with *dhar*, to bear. ·

*t* is plainly a determinative in *kart*, to cleave, as compared with *kar* (= *skar, shear*); in *pat*, to rule, as related with *pa*, to protect; and, perhaps, in *pat*, to attain to (*peto, find*), as connected with *pa*, to obtain.

*d* seems to appear certainly as a determinative only in a few roots. One clear case is that of *mard*, to crush, related to *mar*. For *sad*, to sit, there appears evidence of a primary *sa*, in Sanskrit *ava-si-ta*, literally, situated, and Latin *si-tus*, *po-si-tus*, placed; *mad*, to measure, as compared with *ma*, is also probably Proto-Aryan.

*dh* is found as a determinative in a few well-proven cases: *kudh*, to conceal, may be compared with *ku* (*sku*), *yudh*, fight (join battle), with *yu*, to join.

*n* is a clearly-marked determinative in several cases. We may compare *gan*, to beget, with *ga*, (as in γέ-γον-a, γε-γα-ώς); *tan*, to stretch, with *ta* (as in τα-τός, τά-σις); *man*, to measure (as in *mensus*), with *ma*.

*p* is one of the most common Proto-Aryan determinatives, and easily recognized in most cases. We may bring together *karp* (*kalp*) to procure, *help*, and *kar*, to make; *dap*, to divide out, and *da*, to divide; *rip* (*lip*, a-λείφ-ω) to anoint, and *ri* (*li* as in *li-nere*); *sarp*, to creep, with *sar*, to go.

*b* is not to be proved as an independent determinative in

[1] Op. cit. iv. p. 61 ff.

accessible forms. As we saw in our last Article, its place was taken by *bh* in current speech. This sound occurs at the end of at least two secondary forms: *gharbh*, seize (if this is the original of the Sanskrit *garbh*, *grabh*, Eng. *grab*). as connected with *ghar*; *stabh*, to support, as compared with *sta*, to stand.

*m* is found as a determinative in *gam*, to go, cf. *ga*; *dam*, to bind (*tame*), cf. *da*; *ram*, to delight in, cf. *ra*, as in ἔραμαι; *dram*, to run (δρόμος), cf. *dra* (δι-δρά-σκω), and a few others.

*y* and *v* are not found as determinatives, nor indeed as final sounds in Proto-Aryan. Being semi-vowels, they would not have been sufficiently distinct for this purpose. They were used often, however, in the development of special roots in different branches of the family.

*r* is a very common final letter in roots, but it is generally difficult to acknowledge that it is a determinative in most of the cases adduced as evidence. Such a function may perhaps be allowed to it in *tar*, to cross over, as compared with *ta*, to stretch; in *dar*, to burst or tear open (δέρω, *tear*), as related with *da*, to divide, and it appears certain in *star* (*stal*), to place firmly (Sanskrit *sthira*, firm; German *starr*, *stellen*,), as connected with *sta*, to stand.

*s* is an obvious determinative in a good number of instances. Thus we may associate *raks* (English *wax*), to grow, = *vag-s*, with *vag* (*ug*), to increase (as in English *eke*; German *auch*); *dhars*, to be confident (θάρσ-ειν, *durst*), with *dhar*, to hold (*firm*); *bhas*, to shine (found in English *bare*), with *bha*.

In the foregoing discussions we have not taken account of the claim made by Pott[1] in behalf of several Proto-Aryan roots, that they are made up of older forms, with fragments of other words prefixed. Such supposed prefixes are mostly prepositions, as in *bhrag* (*bharg*), to shine, as compared with *rag* (*arg*), of the same meaning, in which the *bh* represents the prepositions *abhi*, as found in Sanskrit. Other

[1] Etymologische Forschungen (2d ed.), Vol. ii. p. 297 ff.

kinds of words are also supposed occasionally to perform the same office, as the adverb *su*, well, in *svad*, to taste ($\check{\alpha}\nu\delta$-$\acute{\alpha}\nu\omega$, $\acute{\eta}\delta\acute{\upsilon}\varsigma$, *sweet*), made up of *su* and *ad*, to eat. Some of the alleged instances of such combinations are very plausible, and many are not so. For full discussion of the whole subject, the reader is referred to Curtius' Grundzüge,[1] where the theory is, we think, shown to be untenable.

The results of the investigation are briefly these: 1. Of those forms which differ from others in showing an additional element, there is only one group that has this at the beginning, namely, those in which *s* appears as the added factor. 2. There is good reason to hold that no root is modified by the insertion of any letter: the infix *n* we may call a stem-determinative, rather than a root-determinative. 3. We have found the vowel *a* used as a post-determinative, and also nearly every one of the original Indo-European consonants.

If we compare the various forms in which the additional letter occurs, it will be seen that these added sounds are of different degrees of significant value, and that the same sounds are not always of equal importance in this respect. Thus the vowel *a* seems to have usually little modifying power; but *mna* (= *mana*), to think upon, remember, is clearly discriminated by it from the more general *man*. Again, the added nasals seem sometimes, like the inserted *n*, to modify stems, rather than roots; but in *dam*, to subdue, tame, we have an obvious specializing of *da*, to bind.[2] Again, the initial *s* (as in *snu*, to float, compared with *nu*), gives or takes away no apparent force, in most cases, from the shorter form; and for this reason, as well as on account of the general uncertain tenure of the *s* in various languages of the family, Fick and others choose to regard the longer form as the earlier, and so do not consider *s* as a determina-

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[1] Etymologische Forschungen (5th ed.), p. 31 ff. English translation (of 4th ed.), p. 38 ff.

[2] Fick, in his classification, to which we have been very much indebted, gives *m* and *n* a place by themselves as being of less importance than the other determinatives. This is perhaps unnecessary.

tive at all in such cases.   It is impossible to prove, however,
that the *s* was really dropped from the beginning of any
Proto-Aryan root; and it would seem to be more in accordance
with analogy in root-formation that the.shorter form should
have preceded.   But we think we can show, in one case at
least, that the *s* is a true determinative, and the shorter the
more primitive form.   The root *tan*, already alluded to,
means to stretch.   But it yields derivatives which, along
with this sense, also express the notion of sounding.   Thus
Skr. *tána* and Gr. τόνος mean both stretching and a *tone;*
and Quintilian [1] shows us how this is possible when he uses
the Latin word *tenor* (properly a sustained course) in the
sense of accent or *tone*.   Going a little further, we find that
in Latin *ton-o* means *to thunder*, our own English word being
radically the same,[2] as also does the Skr. *tan* (*tanyati*).
Now we take up the root *stan* to sound, or, more specifically,
to make a deep sound.   This is found in the Skr. *stan*
(*stanati*) ; Gr. στέν-ω, to groan, as well as in the modern
German *stöhnen*.   Curtius,[3] who connects the Lat. *tono* with
*tan*, to stretch, hesitates to associate the latter with *stan*, to
sound, against the opinion of Pott, Benfey, Corssen, Walter,
and Grassmann.   But the fact that the Skr. *stan* (*stanayati*)
means also to thunder, as well as to groan, bringing itself
alongside of *tan* in this secondary sense, seems to complete
the analogy between the two roots.   Thus *tan*, to stretch,
came to express the idea of a sustained or resonant sound ;
while *stan* was specialized into the notion of a deep, heavy
sound, the noise of *thunder* being equally well associated with
both.   In this instance, then, *s* is clearly a determinative ;
though, as we have seen, it is the only initial sound so used
in Proto-Aryan.

The question naturally arises, in connection with this
sound, as also with any of the final determinatives, Is it

[1] Inst. Orat., i. 5. 22, 26.   See Harper's Latin Dictionary, s. v.

[2] Max Müller, Lectures on the Science of Language (Am. ed.), i. 364, warns
us against the fancy that the word *thunder* is onomatopoetic.

[3] Grundzüge (5th ed.), p. 217.

necessary to regard any of the forms as more primitive than the others? For all we know, may not all the variant roots have arisen side by side, without reflection, each with its own special significance, according as each idea seemed to require its fitting expression? Or another position may be taken, as by Max Müller,[1] namely, that the longer forms in any group (as *mark*, *marg*, *mard*, and *mardh*) may gradually have dropped their distinctive features, leaving only the constant formula (as *mar*) to express the general notion. These points are not of so much importance in our comparative study as they might seem at first sight; for in either case, if we find the same constant formula employed to express the same idea in both Aryan and Semitic, we are entitled to use the fact for verbal comparison just as freely as a similar correspondence between Sanskrit and Greek might be employed. But the questions are worthy of the attention which our space will allow.

As to the first, it should be answered that human language is not merely a system, co-ordinate and harmonious, but also historically a growth or a development from the very beginning, even in its radical or uninflectional stage. The *hortus siccus* exhibited by Renan in his Origine du Langage, with its dead roots and withered stems, cannot fairly represent the actual state of primitive speech. No one can compare any group of roots, of similar forms and meanings, in any system of speech, without seeing that they bear upon their very face the evidence of a change in representative sounds corresponding to a change in the ideas to be represented,— unless the observer is hampered by some philosophical theory requiring him to maintain the contrary opinion.

The second theory does not deny a living progress in primitive speech, but holds to a generalizing of forms with special meanings, rather than a specializing of ideas already general. We would say that the question here is not connected with the influence of phonetic decay; it has to do with the formation of the very elements of speech. Now,

[2] Chips from a German Workshop, Vol. iv. p. 129.

experience shows that such forms arise by composition and addition in all processes that are akin to root-making. Again, as Curtius remarks,[1] the fuller forms are the later ones. The process of expansion in roots can actually be watched as we trace the growth of the different members of the family after its breaking up.[2]

Another question of some importance remains. Can we get at the significance of these determinatives? Not in all cases, nor in most. We ought to decide, however, as to what sort of significance they may bear. Curtius says[3] that if the theory of a simultaneous development of " clusters of roots " is rejected, we must assume that there was an expansion of roots by composition, in which the added elements would have to be considered as weather-worn stems. But that seems hardly necessary in all cases. In later forms, after the original creative faculty had lost its force, such would doubtless be the character of the determinatives; and in the suffix *dh*, at least, there seems to be good reason for tracing a connection with the common root *dha.* Such also may have been the origin of the determinative *p*, which forms a causative in some Sanskrit verbs, and serves to convey the same force sometimes as the final sound of a root. Still, there is nothing certain about these cases, and in most instances not even can a plausible conjecture be made. There seems, indeed, no reason to disbelieve that the earliest determinatives were themselves as primary as the roots which they modified, and that they stood as the symbols of general qualifying notions. rather than as fragments of previously existing stems. No difficulty presents itself against this theory which would not equally press against any doctrine as to the significance of the roots themselves. In considering root-formation in Proto-Semitic, the same conclusion appears also inevitable there; and a close study of the latter subject would, we think, be very serviceable to Indo-European

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[1] Grundzüge (5th ed.), p. 66, note ; cf. p. 69, note.

[2] Thus the root *sta* is Proto-Aryan ; *stand* is Teutonic.

[3] Op. cit., p. 69, note ; English trans., p. 90, note.

specialists, as tending to throw light on the workings of the mind of man in his evolution of primitive speech.

It only remains to be said, in this connection, that, as a matter of course, any true Proto-Aryan root may be used for purposes of comparison, whether it be primary or secondary. The matter is one of scientific etymology, and the only restriction to be set in the choice of comparable forms is obviously this : that any root which can be proved to have originated in any single one of the three great divisions of the family — the Indo-Eranic, Graeco-Keltic, and Slavo-Teutonic — must be rigorously excluded. Thus it would be allowable to compare the root *bharg*, to break, as well as the primary *bhar*, with any Semitic form, because the former root, though perhaps not to be found in Indo-Eranic, occurs in the widely-divergent Graeco-Italic and Slavo-Teutonic, and therefore is probably Proto-Aryan. Again, not only may the primary root *bha*, to shine, be used in comparisons, but also its secondary *bhar*, and even the more fully expanded form *bharg*, of similar meaning, since all these are found in all the divisions of the family. But it would not be proper to use the Teutonic *hlad*, to lade, or *gald*, to be worth, since these are not found in any other division.

We have now to take up the subject of the morphology of Proto-Semitic roots. The problem here is the same as that presented in the Proto-Aryan, and the method of solving it the same as that just employed for the latter system. The subject, however, is one of greater difficulty and obscurity, and we shall not be able to get much light upon it from the labors of previous investigators. As this field is not so familiar to linguistic students as the Indo-European province, we shall exhibit the true process of inquiry a little more in detail.

First, of course, we have to fix the true criteria of a Proto-Semitic root. It is manifest that we must begin by showing that any such hypothetical form must be found represented in more than one branch of that family. The four great divisions we take to be the Assyrio-Babylonian,[1] the Aramaic,

[1] The relations of the Assyrian seem to show that the old division into

the Hebraic, and the Arabo-Ethiopic, with their respective dialects. A root found in any two of these, which has not been borrowed, is probably Proto-Semitic ; a root found in in any three is certainly so. Now, in ascertaining the true roots, whether primary or secondary, we must, of course, have respect only to the laws of Semitic speech. In the last Article it was shown that of the phonetic elements of that system some were certainly secondary. But it must be remembered that of these only a few modified sounds were developed after the breaking up of the family ; and it is to the regular phonetic stock employed by the Semites in their common home that any hypothetical root must be referred. As a general safeguard, it should be remembered that the question before us at present is purely a Semitic one. In the analysis of roots the object must not be to try to quadrate them with the Proto-Aryan, but to see what results may be arrived at from a study of Semitic morphology alone, without regard to the phenomena, or even the existence, of any other human idiom. The fact that such investigations have usually been made in the interest of a reconciliation with the Aryan system has tended to discredit the conclusions arrived at by previous inquirers.

The first thing that strikes any one who takes a survey of the Semitic field is the remarkable fact that all the roots of that system of speech when inflected appear in a triliteral form, at least in all those dialects which have reached their highest flectional development. This phenomenon is undoubted, and expresses an undeniable tendency of the earliest speakers to make all the roots tri-consonantal, however they

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Northern and Southern Semitic is no longer satisfactory. That language has apparently the greatest resemblance to Hebrew in its vowel-system as well as in its general phonology, stem-formation, and vocabulary ; but it is also closely related to Arabic in specific points almost as essential. And, what is most remarkable, it seems upon the whole to differ from the Aramaic as widely as from any other member of the group. It is impossible to make Assyrian a dialect of any other language ; and, in general, we cannot unite any of the northern members of the group with one another or with Arabic, as closely as Ethiopic is united with the latter.

may seem to have disregarded the principle in some cases, which we shall notice presently. The question at once arises : Must we hold that all these roots were tri-consonantal from the beginning, and that the apparent exceptions are only degenerated, shortened forms ; or do any of the roots show peculiarities that would lead us to infer that they have developed from more elementary conditions ? An affirmative answer seems due to the second alternative; and, though this is not the place for a full discussion of the matter, we shall adduce a few of the considerations that seem to point clearly to that conclusion.

First, we have the co-existence of a large number of roots of similar sound and related meanings, which differ from one another only in one of the radicals. Thus (*a*) the first two consonants of each member of the group are the same, the third being different throughout the list ; or (*b*) the last two radicals of some roots may contain the constant formula, the first being the variant; or (*c*) the second letter may appear as additional, the first and third representing the essential significant combination. This would seem to show that the forms with the variant letters were developed from earlier roots represented in the present stage of the language by the two constant letters in each hometymous group.

Further, we have still more conclusive evidence from those hypothetical forms in which the third radical is the same as the second. Comparing with class (*a*), mentioned above, we find that in nearly all those groups of roots which agree with one another in the first two consonants and differ in the last, there appear forms in which the last letter is not a variant, but merely the second repeated. Moreover, such forms (giving rise to the so-called ʽעע stems) are generally more comprehensive in meaning than the related roots with variant letters, containing the generic idea whose specific modifications are expressed by the divergent forms. These facts indicate that they represent an earlier expression of thought than the longer roots, and this is naturally obtained by dropping the repeated consonant. In other words, we

infer that the early speakers developed these assumed tri-literals from earlier biliterals by simply repeating the second sound. The production of the hometymous forms is thus more easily accounted for, upon any theory of phonetic and morphological symbolism, than if we were to suppose that the longer forms were the earliest. In fact, the latter sup-position would only accord with the theory that the Proto-Semitic language was not a growth at all, but an institution founded after solemn deliberation. In that case we would have to suppose that the primitive Semites, in convention assembled, passed a resolution to the effect that no one should frame and pronounce a word having a root of either more or less than three legal consonants. For we must remember that these forms are evidently a part of the very oldest stock of roots in the whole system ; and unless we assume a phonological miracle, it is impossible to believe that such an elaborate and consistent complexity of sounds could be the first expression of Semitic thought, especially when the combination looks so much like a mere prolongation or repetition of simpler elements.

Again, it must not be overlooked that the Semites disliked the close repetition of the same sounds rather more than other peoples did ; and we can best account for their tolera-tion of such phenomena, either before or after the family separation, by assuming that, in order to conform to the tri-literalism which the increasing demand for adequate expres-sion had gradually been developing, they first doubled the second letter in certain biliteral roots, and then in certain inflections and derivatives from the same roots sounded that letter a second time.[1]

In this discussion we have adopted the current terminology of these roots, as though the second radical were actually repeated in the ultimate basis of noun and verb stems. But it is really doubtful whether in Proto-Semitic such a repeti-

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[1] On the question whether the doubled or the repeated forms were the earlier, see the just remarks of Stade, Lehrbuch d. hebräischen Grammatik (Leipzig, 1879), § 143 a.

tion occurred at all. The Assyrian, otherwise not highly developed among the Semitic languages, is the only member of the family that makes them in the verb-stems consistently triliteral, while in none of the dialects are shortened forms given up in the noun-stems. Moreover, there are certain of the inflections which seem to show that a third radical did not primarily exist. Otherwise, it is hard to explain such a form as the imperfect יִקֹּר in Hebrew. If the root were really קדר, the third radical, not being weak, would have to be retained or represented. We must, then, regard such עע roots as real biliterals in Proto-Semitic. Accordingly, whether we apply to the subject inductive or deductive arguments, the result is the same. Thus a large class of current Semitic roots yields to analysis, and the principle of triliteralism is shown not to be inviolable.

Still further, we have the evidence afforded by the so-called עי and עי verbs. The close relation between these and the class just discussed has always been observed, and the conviction is now pretty well fixed among Semitic scholars that they have a common origin, however remote this may be. There is no doubt, however, that these roots assumed an independent form before the breaking up of the family, as they are found with a characteristic system of inflection and derivation in all the dialects. Yet here, again, the proof of triliteral origin is wanting. Of course, it is easy to say that the prevailing type of stem-formation in the Semitic generally points to a triliteral beginning here as elsewhere. It is just here, however, that the very premises of such an argument fail us. In some of the dialects the stems are not triliteral at all. In Assyrian we have the most imperfect development of these forms. The verb stems coincide in some of the conjugations with those of עע verbs (as in Hebrew, and to a less extent in Aramaic) and are even confounded in others with מי and מא forms. In Hebrew, also there is no characteristic triliteral stem-formation. In all the stems we have regularly a biliteral base. The intensive stem is no exception, since it simply repeats the last radical,

forming the so-called Polel (Proto-Semitic Palel), after the analogy of the ‘עע roots. The existence of the form קוֹם may be pointed to as rebutting our sweeping assertion. But this only confirms our general position; for it is only in later writings that such a form occurs, which would, of itself be conclusive proof that the tendency was to develop triliteral forms from shorter ones, and that the current biliterals are not degenerations of longer primary forms. The designations usually given to this class of verbs call for some remark. The name ‘עי is misleading. The true ‘עי root is that in which the י is a primary consonant, as in Hebrew עיר, and many other cases in the various dialects. The native Arabic grammarians call them concave, or hollow, roots, a term which shows how slight is the claim these forms have to be considered tri-consonantal, even in that most fully developed of Semitic tongues. The appellation, roots with a medial vowel, is hardly manageable in English. The formula עַו, adopted by Stade in his Lehrbuch, is not correct, inasmuch as it assumes that *û* is invariably the inherent vowel. The Arabic designation seems to characterize the typical form pretty fairly, and is, perhaps, on the whole, the one to be preferred. Our view of the origin of the whole class will be given when we come to treat particularly of its formation.

Evidence, no less clear, of a development of shorter primary roots is afforded by the so-called ‘לה stems. These undoubtedly point to a primary form similar to those which the other two classes imply; and with them, also, it is clear that the final element cannot originally have been a consonant. The most definite thing to be said about them is that the old root appears to have been expanded by the addition of a vowel, *i* or *u*, at the end, which, under certain conditions, became hardened into a semi-vowel, *y* or *v*. The phenomena of noun and verb inflection in all the dialects point to this conclusion. The assumption that the original form in each case was triconsonantal is met by a multitude of facts which it cannot be reconciled with. Take, for example, verb forms in Hebrew, Assyrian, and Aramaic, which stand here

upon nearly the same level of development. It is not easy to account for the 3. fem. sing. קָֽטְלָה in Hebrew, or the 3. pl. גָּלוּ, and analogous forms, on the theory of a degeneration from triliterals. But it would require even greater ingenuity to show that a like origin is to be assumed for the suffix forms of this class of verbs in Hebrew, as e.g. גְּלָם, גְּלָךְ, גְּלָנִי. The suffix-formation is very old — Proto-Semitic in fact — and even in other dialects, where a fuller form is used before suffixes, the same reminiscence of a shorter stem is observable.[1] Of course it is not here maintained that the longer type of formation with the added vowel or semi-vowel was not developed in the Semitic family before its breaking up. On the contrary, we believe that these *quasi* triliterals are really Proto-Semitic. It is only claimed that, as we learn from forms exemplified by the preceding citations, the only satisfactory theory of their ultimate origin is the one just given.

From all that has been said, it is clear how little evidence there is for the assumption that all the Semitic roots were originally triconsonantal. The three classes known as עע, עי and לה roots were all developed from shorter forms, according to fixed principles. Having thus secured a sure means of ascertaining the primary roots of the system, we shall now exhibit in detail, as was done with the Proto-Aryan, the various modes by which the secondary roots are developed.

First as to the development of secondary roots through predeterminatives, or the prefixing of an additional sound. According to our observation, no letter, with the exception of gutturals, is thus employed in Proto-Semitic which is not also

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[1] For example, the Mandaite and Talmudic dialects, which in these forms agree more nearly than do the Syriac and Hebrew with the perfect verb, also show occasional instances of the use of the shorter primary stems. Prof. Nöldeke, than whom there is no higher living authority on such matters, says on this point : " Whatever theory may in general be held as to the origin of the weak roots, no doubt can be entertained that in *these* forms, the employment of the third radical as a consonant is secondary, and has been brought about through the analogy of the strong verb." — Mandäische Grammatik (Leipzig, 1875), p. 284.

a formative or inflective element of the language — a fact of the very highest importance in its bearings both upon Semitic and upon general linguistic morphology.

א[1] is a predeterminative in Proto-Semitic, as may be seen from the cases now to be cited : בד, to cut off, separate (Heb. בַּד; Arab. بَنّ) yields אבד to be separated, to be lost, to perish (Heb. אָבַד; Aram. אֲבַד, أَصُّ; Eth. ㅿㄇㄥ). כף to bend (Heb. and Chald. כַּף, Syr. ܟܦ, to bend; Arab. كَفَّ, to turn aside), gives us אכף, to bend for a burden (Heb. אָכַף in causative sense, cf. אֶכֶּף, burden; Syr. أَܟܦ, to oppress; Arab. أَكَفَ, II. IV. to saddle). Other examples are found in אסף, to scrape up, add, accumulate, from סף, to scrape ; אסר, to bind, from סר, to press together, bind. These also may be abundantly attested as Proto-Semitic.

ח is a rare predeterminative in Proto-Semitic ; nor is it a very common one in any of the dialects in their separate history. A very probable instance we take to be found in חבר, to divide up (Heb. חבָר, ἅπ. λεγ. ; Arab. هَبَر) from the familiar root בר to cut, divide. On the same level stands חרם, to be high (Heb. חרם, found in derivatives ; Arab. هَرَم, whence هَرَم[6], pyramid), from the widely-extended root רם. The root חלך, to go away (Heb. חָלַךְ; Aram. הַלַּךְ, الَّכ; Arab. هلك, to perish), furnishes another example ; for though לך is not found as Proto-Semitic, it may be inferred with certainty, through a comparison of the related forms, ילך, חלך, שלך, לאך, as represented in various dialects, in all of which the notion of going is manifest.

ו is a predeterminative in the following among other cases. ירד, to go down (Arab. وَرَدَ, to go down to the water ; Heb.

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[1] The letters of the Hebrew alphabet will be used throughout to represent primary Semitic sounds and forms. ש must of course be used without the diacritical points.

ירד, and Assyr. ארד [1] to descend, for the earlier ורד), proceeds from רד, to thrust, push, cause to go (Heb. רַד; Arab. رَدَّ; cf. רָדָה and رَدَى). יכל, to contain, hold, be capable (Heb. יָכֹל, to be able ; Arab. وَكَلَ, to regard as able, trust in ; Assyr. אכל [1] contain, maintain), is developed from כל, to surround, enclose, contain, one of the most common and widespread of Semitic roots.

י is a predeterminative in יקץ, to awake (Heb. יָקַץ; Arab. يَقَظَ and يَقَضَ), as compared with קץ, which, though only found in Hebrew, is almost certainly Proto-Semitic. We may also compare ימן, the root of the Semitic word for the right hand, with אמן, to be firm, found in all the divisions of the family ; and ישר, to be right, prosperous, with the kindred אשר, both Proto-Semitic, as being found in all the dialects. י was not employed in this way by the early Semites nearly so often as ו.

ח is probably a determinative in the Proto-Semitic חנק, to press, choke, make narrow, found in all the dialects, either in noun or verb stems. This may be connected with the equally ancient ענק, to put round the neck, if the primary notion of the latter is of close binding ; while the Syr. خَنَقَ, Chald. שַׁנֵּק, Arab. شَنَقَ, to strangle, is clearly a kindred causative. Another case is perhaps the ח in Proto-Semitic חדל, to let go, cease, etc., as connected with דל, to be loose, which is developed in various forms throughout the family. חתם, to close, seal, may possibly furnish another example, but the proof would be precarious. We must acknowledge that the evidence is not conclusive for any other instance of the use of ח as a predeterminative. The persistence and independent

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[1] According to the law discovered and established by Oppert (see his Grammaire Assyrienne, 2d ed., 1868, p. 9 f.), the Hebrew יפ forms usually becomes יאפ in Assyrian, if they correspond to פי in Arabic ; but when the Arabic preserves the Hebrew י the Assyrian does so also. The Hebrew forms require no explanation.

force of this sound from the earliest Semitic times, is one of the most important facts in the phonology of the system.

מ is a predeterminative in one or two roots with a causative force. Thus מטט, to extend, lengthen (Heb., Arab., and Targ., either in noun or verb stems), may be compared with טול, to be long (as in Arabic; the Heb. הַטִיל means to throw = send along). Such developments were common enough in the several dialects in their separate history. In Ethiopic they became quite fashionable. In the primitive speech they were very rare — a fact which may perhaps go to show that מ as a servile letter was of later origin than some of the others, being a nominal, not a verbal formative.

נ was a very common Proto-Semitic predeterminative. Thus, נתן, to give (Heb., Chald., Samar.; the Assyr. נדן shows a customary softening of *t* to *d*), is plainly developed from the familiar root תן, to stretch, in the sense of reaching forth. נסך, to weave together, cover over (Heb. סָכַך; Assyr. נסך; cf. Arab. نسج), is formed from סך (Heb. and Assyr. סָך, to weave, to cover; Arab. شَكَّ, to cover with armor). נגר, to move along (Chald. נגר, to draw, to flow; Heb. נגר, to flow, to rush; Assyrian *nagaru* to overwhelm; and perhaps Eth. ነገረ, to speak = make words flow forth, express), is developed from גר, a common Semitic root, meaning to drag, draw along. The Arab. جَرَى, to flow, is an instructive connecting link. Many other examples might be adduced.

ע seems to be, in a few cases, a Proto-Semitic predeterminative. עקר, to cut, dig out (Heb. עָקַר, with kindred meanings in Chald. and Syr.; Arab. عَقَّ, wound, etc.), is probably formed from the wide-spread primitive root קר, to cut, dig. ערך, to dispose in order, arrange together (Heb. עָרַך; cf. Eth. ተዓላ, III. 3, to make an alliance or friendship), cannot be separated from ארך, to stretch out (Heb., Arab., Syr., and Samar.; Talm. to arrange, prepare; for the connection of meanings, cf. the Latin *rego* with *rectus*).

ט is an occasional predeterminative in primitive Semitism.
We may compare here the two roots יבל and שבל, to flow,
go, which agree remarkably in Heb., Arab., Aram., and Assyr.,
either in the primary or secondary senses, or in both ; and
that with respect both to the verb and the noun stems. The
root כן (כון), to be fixed, gives rise to שכן, which in Assyr.
has the proper causative sense, to establish, and in the other
dialects becomes reflexive or intransitive : to establish one's
self, to dwell. שכב, to lie (Heb., Aram., and Ethiopic), is
probably developed from the old root כב, to bend, curve (cf.
*recline*). ט was much more frequently used in this way in
the various dialects in their separate history, such an employ-
ment of it being specially noticeable in Assyrian.

Of the use of ת as a predeterminative, of which we find
frequent examples in the later history of the dialects, we
find at least one sure example in Proto-Semitism : תקן (Heb.,
Aram. and Arabic, to be straight, solid ; cf. תכן) from the
ancient root קן (cf. כן); while others are probable.

Next, we have to consider the various modes of expanding
a primary root by means of internal modifications, or the use
of indeterminatives.

א is an indeterminative in באר, to dig (Heb., Arab.,
Aram., and Assyr., in noun or verb stems), springing
from the wide-spread ancient root בר, to cut, to bore. The
same use is exemplified in מאר, to be large, great (in Assyr.
noun and verb stem in the general sense, as also in noun-
stem in Heb. ; in Arab. specially of the growth of plants : cf.
مَهَّكَ, to spread) from the root מר, to extend, found through-
out the Semitic system. We may also compare מאס, to flow,
as blood from a wound (Heb., Chald., with an allied sense in
Arabic), and מס, to be liquid, also unquestionably primitive.
Many other examples might be adduced ; and it is safe to
say that in every case in which the last letter of a tricon-
sonantal root is " strong," and the first letter primary, a
medial א is determinative. Here, as elsewhere, א is used in
the interest of a vowel, which is the real modifying element
in this variety of root-formation.

ה is an indeterminative in נהר, to shine forth (Assyr.,
Aram., Heb., and Arabic, in noun or verb-stems, or in both) :
cf. נ׳ר, to shine. which appears likewise in all the divisions of
the family. So also דהר, to revolve, keep going (in Assyr..
Aram., Heb., and Arabic, either in noun or verb stems).
developed from the ancient common root דר (cf. דור). In
this use ה is nearly as common as א.

ו, more frequently than any other letter, represents an in-
ternal development of the root. It is, of course, demonstrable
that this shows a secondary form only when we can compare
with the simpler so-called ע׳ע roots. Such cases, however, are
quite numerous. Thus we have גור, to turn aside, sojourn,
found in all the dialects, as compared with גר, to turn, to
twist, to roll, equally Proto-Semitic ; דור, to revolve, as
related with דר, which expresses various kinds of irregular
motion in the different dialects. We may compare also
נ׳ר and נר, both primitive roots expressing rapid motion and
flight ; סר and סור, both Proto-Semitic, of which the former
means, to arrange in a series, to number, and the latter, to re-
peat. Many other cases might be cited ; and it may be stated
as a general fact, that when we have an ע׳י and an ע׳ע root, side
by side, with the first and last letters the same in both, the
radical notions in both may be easily connected. Objection
might be brought on the score of the want of association
between a few of such cases. The only exceptions we know.
of in Proto-Semitic are the roots from which spring י׳ם, day,
and ים, sea (but we have not any verb-stems from these
roots, and therefore can say nothing as to the primary
meanings), and חול, to whirl, twist, which does not seem
connected with חל, to pierce, to open. שוב, to return, may
be explained as connected with סב, to turn around ; at
least, that is the only primitive root with which it can be
compared.

It is now proper to give what seems to us to be the true
view of the origin of these forms. It being quite certain
that inflection had begun long before the roots had been
universally raised to the tri-consonantal type, the matter of

assimilating the shorter forms to that standard was accom-
plished apparently in this way. While the עע roots reached
this level by having the second radical emphasized or doubled
(and afterwards, in certain inflections, repeated), the עו roots
entered upon the same stage by having the characteristic
vowel of each stem lengthened. Thus *kam* in inflection
would become *kâm :* and *kum, kûm.*[1] Not till a much later
period did the more highly developed of the Semitic dialects,
Arabic and Ethiopic, make of these stems distinct roots.
From this it follows that a medial ו represents merely a
lengthened inflective vowel in Proto-Semitic, and not a
radical sound.

ה as an ancient indeterminative can be held to be probable
in only one instance that we can adduce. A plausible case is
מהר, the root of מחיר, price, which it would seem proper to
connect with מכר, to sell, and מיר, to exchange.[2] But it is
not Proto-Semitic in that sense, only Hebrew; the Assyr.
*mahirn*, offering, tribute, which Lenormant[3] connects with
מְחִיר, being derived from the native root מהר, to be in front,
and in causative forms to bring before, or present.[4] A surer
instance is found in סחר, to go round, traverse (Heb., Aram.,
and Assyr.), as compared with סהר, to be round (Heb. and
Aram.; cf. Arab. شَهْر , moon, with Heb. סַהֲרוֹן, and Syr.
ܣܗܪܐ), both of which may be connected with Heb. סור, to
turn aside, from the primary notion of bending. Of course,
it may be suspected that סחר may be merely a strengthened
form of סור, especially as in Assyrian the former root has
the intransitive meaning attaching in the other dialects to
the latter. In general, we may say of medial ה what has

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[1] See a brief but instructive discussion of this question by Prof. A. Müller in
Zeitschrift d. d. morg. Gesellschaft for 1879, p. 698 ff.

[2] Not with מָכַר to sell, which is probably a secondary, derived from כרה
to buy (cf. the use of ט as a predeterminative discussed above).

[3] Étude sur quelques parties des syllabaires cunéiformes (Paris, 1876), p. 247.

[4] The conjecture of Friedr. Delitzsch (Assyr. Studien, Part i. p. 125), that
the Hebrew and Assyrian roots are connected, is probably wrong.

been said already of initial ה, that it is normally a primary
and stable sound.

Medial י appears to represent an expansion of the root in
several cases. שׂים, to place, lay down (in noun or verb
stems in Heb., Aram., and Assyr.) must be compared with
שׂת, which is also probably primitive, being found in both
Heb. and Aram. in the same sense. So also apparently
with ציץ, to fashion, forge, as compared with קן, to set right,
prepare.

In these י appears to be Proto-Semitic; and yet here, as
well as in the many cases where 'עי and 'עי forms exist side by
side in the same sense, it is very doubtful whether the י is pri-
mary. It seems more probable that it took the place of ו in
these instances; it having perhaps been shortened from the
causative form of the verb-stem in each case, since such 'עי
stems are mostly transitive. If this view is correct, we
cannot maintain that י represents a Proto-Semitic indeter-
minative, but are obliged to hold that medial י stands with
medial ו for that very early lengthening of the inflective
vowel by which the primary roots were made to assume a
triliteral guise.

ע is an indeterminative in בער, to be separated from (repre-
sented in Heb., Arab., and Ethiopic) as compared with the
universal root בר, to divide; also in בער, to cut off, consume
(appearing in Heb., Aram., and Arabic) as related with the
primitive root בר, to divide; so too evidently in צער, to be
small (in Heb., Aram., and Arabic) as developed from צר,
to press together, contract, also Proto-Semitic; and in
several other cases, amounting to about one half of the whole
number of roots in which ע appears as the middle radical.
In nearly all the remainder with medial ע the first letter is
a determinative: thus, it would seem, ע was not liked as
the second letter of primitive biliterals, while, as we have
seen, it was frequently employed as the first — an instructive
fact in Semitic phonology and morphology.

These are the only letters we can regard as undoubted
Proto-Semitic indeterminatives. Others (as נ, ר, ל, ת) were

used more or less freely in the different dialects during their separate history, especially in the formation of quadriliterals, which are all secondary roots.[1]

Lastly, we have to take the final determinative letters in Proto-Semitic. These are much more numerous than either of the other two classes; the true place of the additional sounds in secondary roots being at the end, as in the Aryan family.

א represents a post-determinative very frequently. So in ברא, to hew out, fashion, create (in Heb., Aram., and Arabic), from בר, to cut, which is variously represented in all the dialects. So also in כלא, to shut out, to obstruct (Heb., Aram., and Arabic), as compared with כל, to shut, close, finish (found in noun or verb stems in all the dialects). It appears in many other examples that might be cited; and we are inclined to set it down as a principle that wherever א appears as the last letter of a root, it is of secondary origin, unless the first letter is a determinative. This might be inferred from the character of the sound itself, which only exists for the sake of its vowel; but it may be proved in nearly every case by actual comparison with kindred forms. The only instances in which this is not practicable are probably מלא, to fill; קנא, to be moved with passion; and צמא, to thirst; and here it is better to assume that the kindred roots are lost or their connection obscure, than to maintain that the א stands so exceptionally for an independent consonant.

ב is apparently a post-determinative in גרב, to be scabby, leprous (Heb., Aram., and Arabic in noun or verb stems), from the widespread root גר, to scrape; in חטב, to hew wood (Heb., Arab., and Ethiopic) from the common root חט to cut; in צלב, to hang up = make incline (Aram., Arab., and

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[1] If the Proto-Semitic root עתד to prepare, could be regarded as having a similar origin to that of عَتَدَ conj. VIII. in Arabic, an instance would be at hand of the use of ת servile as an indeterminative; but this we cannot regard as probable.

Ethiopic), as compared with צלא, to incline, also Proto-Semitic; and perhaps in a few other cases.

ג is a post-determinative in פלג, to divide (in various noun or verb stems in Aram., Heb., Arabic, and Ethiopic), from the root פל, to cleave, burst asunder, variously represented in all the dialects; and perhaps in הרג, to go, proceed by steps (Aram., Arabic, with a Heb. noun-stem), as compared with הרך, and the primary root הר, which seems to express lively motion in general. We cannot adduce any other probable instances from Proto-Semitic.

ד is a post-determinative in חמד, to be ardent (with related meaning in all the dialects[1]), as compared with חם, to be warm; also in פרד, to separate (in Heb., Aram., and Arabic), from פר, to rend asunder; and in several other cases.

ה is an post-determinative apparently in בלה, to be stupid, embarrassed, timid (cf. the Heb., Aram., and Arabic meanings), from בל, to be confounded, confused; probably in אלה, the root[2] of a Proto-Semitic name for God (Heb., Aram., and Arabic, which), as we prefer to think, is a denominative from the shorter אל, also proved to be Proto-Semitic by the Assyr. il-u; and, in general, wherever it occurs as the third radical, as it does but rarely in the primitive speech.

ו, or rather the vowel u, was used as a post-determinative in the primitive speech.[3] So apparently in גלי, to draw off, lay bare, reveal (in Heb., Aram., and Arabic; in Ethiopic, to draw on, cover), as compared with a root גל, evident in גלב, גלד, גלח, of kindred meanings, all Proto-Semitic. So too

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[1] The Hebrew and Chaldee forms mean to desire ardently; the Arabic has one meaning, to be angry (or " warm "); another to deem worthy of praise, i.e. desirable; the Assyrian means to hasten, or pursue ardently.

[2] What the specific meaning of this root was, or whether it ever had more than a theoretical potential significance, is doubtful. The Arabic meaning, to adore, is probably secondary, = regard as God.

[3] It is not easy to say in all cases whether u or i was the original determinative vowel. It is only in Arabic and Ethiopic that the distinction between the two has been regularly preserved. Moreover, in these languages so many new roots were developed in later times with these as final sounds, that the question of priority is still further obscured. It is only where the two idioms agree in important roots, that we can infer surely as to the real state of the case.

in רלי, to let down, suspend, weigh (cf. the various related meanings in Assyr., Ethiop., Heb., Aram., and Arabic, which has also רלי), from the root רל, to hang loose, no less widely represented through the system; and in other cases that might be adduced.

ז is a post-determinative in ברז, to pierce. This root is found only in Heb. and Aram.; but it is proved to be Proto-Semitic by the word for iron, ברזל (פרזל), which is found in all the dialects, and is evidently developed from it, as we shall see later. The ultimate root is בר, to divide open, already frequently cited. פרז, to separate, branch out, is also Proto-Semitic, from the common root פר, related to בר. ז, however, is rarely used for this purpose, as we would natu-rally expect from the fact that it is a secondary sound arising from s: cf. in Hebrew פרז, פרס, פרץ; עלז, בלס, עלו, עלץ.

ה is a frequent post-determinative. So in ברה, to pass through, to pass out, escape (cf. the Heb., Arabic, and Ethiopic stems), as related with בר. So also in גלה, to make bare, smooth, bald (Heb., Aram., and Arabic), as compared with גלב, etc., cited above. It is found, besides, in a few other cases; but was employed far more frequently in each dialect after the dispersion of the family.

ב is perhaps a post-determinative in בלט, to break away, escape (cf. the related senses in Heb., Aram., and Arabic; the Assyr. בלט, to live = to be preserved, is the same root), from בל, to cleave or break open. Possibly, also, in חרט (Aram., Arabic, and Hebrew in noun or verb stems, and perhaps Assyrian) to cut into, grave, engrave, as compared with a root חר, represented in Arab. خرط , to cut open, pierce, divide; in חרש, etc. The Heb. and Arab. שרט of like meaning, we may compare with a root שר, represented in the Heb. שור and שרר, to saw, and elsewhere. ט, however, was not a very common determinative.

ר,[1] or rather the vowel i, was apparently the most common of all the post-determinatives. The following are a few of its examples: נכי, to smite, injure (Arab., Ethiop., Heb., and

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[1] See the remarks just made on ו as a post-determinative.

Aram.), from a common root נב, cognate with נג ; נקי, to be separate, pure (with interesting derived meanings in Arab., Aram., Heb., and Assyrian), as compared with נב, a widely represented primitive root, meaning to strike asunder ; קני, to erect, to establish, acquire, possess (in noun or verb stems in all the dialects), from קן, to be erect.

ב is a probable post-determinative in דרך, to tread (with various associated meanings in Heb., Aram., and Arabo-Ethiopic), as compared with דרג and the primary דר cited above. Also in פרך, to break in pieces, crush, oppress (cf. the noun and verb stems with related meanings in Syr., Arab., Heb., and Assyrian), from the familiar root פר, to rend asunder ; and in a few other instances.

ל is a post-determinative in גרל, to twist together, make strong or great (cf. the various meanings in Aram., Heb., Arab., and Ethiopic), as related with the root גר, to bind, which appears in אגר and גיר, both Proto-Semitic. It is also found in גרל, to tear off, drag off, as related with גר, already cited (both of which are found in Heb., Aram., Arabic) ; and in a few other cases.

מ is a post-determinative in עצמ, to be firm, strong, great (cf. the noun and verb stems in Arab., Heb., and Assyrian [1]), as related with עץ, to be strong, as found in עצה, עיץ, etc. Also in ערמ, to be naked, bare, as compared with עור and ערה, of a similar meaning, all of them being Proto-Semitic. A few other cases might be adduced.

נ as a Proto-Semitic post-determinative can hardly be proved. The only plausible instance we can adduce is גרן, the root of the Proto-Semitic word for threshing-floor (Heb., Arabic, and Ethiopic), which seems to be developed from a root גר, of manifold expressiveness, but having clearly the general sense of dragging along, rubbing, crushing, so that גרן may perhaps be = the place of threshing grain.[2] גבן, to

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[1] The Assyr. *aṣmu* means material, analogous with Heb. עצם bone, in the Inscription of Khorsabad, line 164 (see Oppert's Commentaire philologique).

[2] There does not seem to be any verb-stem גרן clearly Proto-Semitic, which would give a suitable intermediary sense. The Arabic جَرَن, however, means

be curved or arched, if it is Proto-Semitic in that sense, might be connected with גב of kindred meaning; but it is difficult to comprehend all the divergent meanings of the former root under one general satisfactory notion. ג was used more freely for this purpose in each dialect after the family separation.

ס[1] is a post-determinative in פרס, to cleave asunder, break up (cf. the noun and verb stems in Heb., Aram., Arab., and Ethiopic) as related with the familiar root פר; and in a few other cases.

ע is a post-determinative in גרע, to hew off (Heb. and Arabic) from the root גר, variously represented in the sense of cutting; in זרע, to scatter, to sow (represented in Heb., Aram., Arab., Eth., and Assyrian), from the root זר, to spread, scatter, shown in זרי and several other kindred forms; and in many other cases. It is clearly a determinative in nearly every instance of its use as the last radical. Those few cases are of course excepted when the first letter is a determinative, as in יצע, to place; נטע, to set in or set out. It is probable that no ultimate triliteral ended in ע. שבע, to be full, satisfied, is probably no exception.[2] Those who hold to a common origin of סבע[3] and the Indo-European word for *seven* will have no hesitation in considering the ע as secondary in the former word.

פ is a post-determinative in גרף, to carry away, sweep away (in noun or verb-stems in Heb., Aram., Arab., Ethiop., and Assyrian), from the root גר, to drag along, already

to grind corn, thus furnishing a notion kindred to the one required. Its other meaning of smoothing, wiping clean, does not throw satisfactory light on the word for threshing-floor, though it is usually assumed as explaining it.

[1] This we use as representing the Proto-Semitic *s* as distinguished from *sh*. The Hebrew ס appears to have preserved the sound best, though not in all cases. With it agrees in general, the Arabic س, the Ethiopic ⴰ, the Aramaic ܣ and ס, and the Assyrian *s*, as it is conventionally represented; though the disagreements are frequent, except in Assyrian.

[2] See Gesenius' Thesaurus, p. 1319, for kindred forms.

[3] Not שבע. That the other is the Proto-Semitic form, a comparison of Assyrian *sibu* with the Arabic and Ethiopic shows plainly.

alluded to; in נכה (Heb., Aram., and Ethiopic), to smite, from the widespread root נכ, to strike; and in several other plain cases.

צ is a post-determinative in פרץ, to cleave or break open (Heb., Assyr., Arab., and Aramaic), from the common root פר, to divide; and in a few other instances equally clear.

ק is a post-determinative in זרק, to scatter, sprinkle (in noun or verb stems in Heb., Assyr., Aram., and Arabic), from the root זר already referred to; and in several other forms.

ר is a post-determinative in פטר, to open (with various associated meanings in Assyr., Heb., Aram., and Arabic), from the common root פט (פת) of kindred meaning; and in many other forms that might be cited.

ש is a post-determinative in פרש, to separate, scatter, disperse (Heb., פָּרַשׁ; Aram., פָּרֵשׁ and פְּרַשׁ; Arab., فَرَشَ; Assyr., פרש in Niphal, to flee away), from the familiar root פר. It appears besides in only a few other cases; but, like ס, was more commonly employed as a secondary formative in each dialect after the Semitic dispersion.

ת also is an infrequent post-determinative. It appears in צמת, to be silent and bring to silence (cf. the associated meanings in Heb., Syriac, Arabic, and Ethiopic), as related with the root צם, with the primary notion of binding, shutting up, which is extended in the different roots so as to express the divergent ideas of fasting, deafness, dumbness. It is found also in a few other cases, and in some instances of its occurrence the root is perhaps a denominative, formed from a feminine abstract.

We must now put together the results of this investigation into the structure of Semitic secondary roots, and try to classify those sounds used in forming them. First, as to predeterminatives, we found that א, ה, י, ח (probably), ר, נ, ל, ע, ש, and ת were thus used. Of these א represents only a prefixed vowel; for though it is a true consonant it is only used in the interest of the vowel sound that conditions it.

With regard to ו and י, it might seem doubtful whether they were originally prefixed as consonants, or as the corresponding vowels *u* and *i*. On the whole, we incline to the belief that they were at first vowels, and then in course of inflection hardened into semi-vowels. For this the following arguments may be offered: (1) the analogy of the post-determinatives ו and י; (2) the frequent interchange observed in every Semitic period of 'מו or 'פי with 'עי forms developed from the same primary root, — a phenomenon on easy of explanation upon this theory, but more difficult upon the other; the 'כי stems being, as we have seen, merely vowel expansions of 'עצ forms; (3) the fact that consonants are not normally liked as predeterminatives: מ, ג, ש, and ת are used because they are inflective formatives; the other consonants are breathings, and of them ה and ע are rare, and ח doubtful. In all probability we may set down א as representing *a*, ו and י as representing *u* and *i* respectively, when used as predeterminatives.

ה, ח, and ע, used as predeterminatives, probably arose in this way. ח is the surd breathing corresponding to the sonant א, and arose from it through the process of dialectic variation familiar in all languages. Its rarity as a radical prefix is a proof of its late employment for this purpose. From it ה arose by strengthening, and was employed still more rarely. ע is the deep guttural development of א; and as ח is rarer than ה, so ע is rarer than א as a predeterminative.

The true consonants used as radical prefixes, מ, ג, ש, ת, are among the rarest used as post-determinatives; while other consonants, some of which are very common at the end of roots, are not used at all as predeterminatives. The solution of this enigma can only be gained from the consideration that these are letters used frequently as prefixes in the formation of verb or noun stems. And it is remarkable that the frequency of their occurrence, respectively, varies according to the priority of their introduction as stem-formatives, as the phenomena of the Semitic idiom seem to indicate: ג is most commonly employed, then ש, ת coming next, and finally מ,

which seems to have been used for only a short time before the family dispersion.

We have, then, as Proto-Semitic predeterminatives the vowels *a*, *i*, *u* (which were displaced by the corresponding א, י, and ו, under the later consonantal system), the breathings ה, ח, and ע, and the consonants ת, ז, ט, and נ, originally inflective formatives, themselves relics of old independent stems or words. All of these, save the vowels *a*, *i*, *u*, were introduced in the consonantal period.

As indeterminatives we found the breathings א, ה, and ע to be used, and ח, which is rarest as a radical prefix, does not appear here at all, being too much like a true consonant. These all belong to the consonantal stage of Semitism, as also does the vowel expansion, already treated of, expressed currently by י and ו.[1]

As to post-determinatives, we found that all of the consonants, with the possible exception of ז, were so employed. א, י, and ו, however, represent vowels that were used as radical affixes before the establishment of the consonantal régime. As in Proto-Aryan, so in Proto-Semitic, the regular place for determinatives is the last part of the root. A study of the character of the prefixed and inserted radical letters, as compared with the post-determinatives, makes it probable that they would not have been used at all, except in the interest of a manifold development of roots ; since the need of various expression, as ideas multiplied, could be met in no other way ; the genius of Semitism, unlike that of Aryanism, being averse to the use of compound words.

There are a great many Proto-Semitic roots which, so far as can be seen, show no determinative letter ; and there is, of course, every reason to suppose that many of these, as well as many of the Aryan roots, possessed three consonants from the beginning. Of quadriliterals there are no sure examples in verb-stems. In noun-stems there are a few whose triliteral origin is apparent.

[1] Of course there is no inconsistency in making א at the beginning represent a primary vowel, and in the middle a consonant ; for a vowel must have been heard already in all vocal expressions beginning and ending with a consonant.

Two classes of cases yet remain to be considered. First, we have those triliterals in which the third radical is the same as the first. This form, which seems so inconsistent with the ordinary types of Semitic root-structure, is accounted for by an analysis of the roots in question, from which it appears that they are developed from shorter forms by the repetition of the first radical.[1] These also occur in noun-stems in Proto-Semitic, not in verb-stems, except, perhaps, in denominatives. They are common enough in the several dialects as developed later, where their origin can be clearly traced.

Another and very important class of secondary roots are those עי roots that end in א, as the Proto-Semitic בוא, to go in. With regard to such cases we claim, without hesitation, in accordance with the principles already established, that the root originally consisted of a consonant and a vowel. The root was raised later to the triliteral standard only graphically, and not in actual speech, just as the Hebrew לא, not, is sometimes written לוא, though it was never anything in sound but lô. The fact is, that the Semitic roots, before the consonantal period, had as great variety of form as the Proto-Aryan. It is an error to maintain that all the Semitic roots are ultimately tri-consonantal; but it is also an error to hold either that all were developed from biliterals, or that in general the bi-consonantal form is their shortest or ultimate type.

Guided by the principles above set forth, we shall now attempt to draw up a scheme of the possible and actual root-forms in the two systems of speech.

I. A Proto-Aryan root may consist:

(1) Of a consonant and a vowel, as ʼi,[2] to go; ki, to lie down; da, to give.

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[1] This throws light on the origin of a number of obscure words; for example, *bâb* the Proto-Semitic word for gate is, as we conjecture, from the root בא, to go in, enter.

[2] The Greek ʼ is here used to represent the breathing, corresponding to א, which precedes every vowel-sound at the beginning of a word or syllable.

(2) Of a consonant, a vowel, and a consonant, as *'ad*, to eat ; *pat*, to fall ; *tar*, to go through.

(3) Of two consonants and a vowel, as *kla*, to shut ; *pri*, to love ; *pru* (*plu*), to swim.

(4) Of two consonants, a vowel, and a consonant, as *dram*, to run ; *prak*, to ask ; *prat*, to spread out.

(5) Of a consonant, a vowel, and two consonants, as *kart*, to cut ; *bharg*, to shine ; *mard*, to bruise.

(6) Of two consonants, a vowel, and two consonants, as *spargh*, to strive after ; *smard*, to gnaw at.

A root in any of these classes but the first may be secondary. In class (5) probably all, in class (6) certainly all, are secondary.

II. A Proto-Semitic root (taking in both the preconsonantal and the consonantal period), might consist

(1) Of a consonant and a vowel,[1] as בֹּא < בִּיא, to go, or go in (Heb., Ethiop., Arabic, and Assyrian) ; רָא < רָאִי, to see (Heb., Arab., and Ethiopic).

(2) Of two consonants, as בר, to separate (represented in all the dialects) ; עז, to be strong (in all the dialects).

(3) Of two consonants with internal vowel expansion, as א־ל, to be strong, superior (Heb., Arab., and Assyr. in noun or verb stems) ; כון, to be set up, or established, exist (in all the dialects.

(4) Of a consonant, a consonant, and a vowel, as בלא, to shut up or out (in all the dialects) ; רלי, to let down, suspend (represented in all the dialects) ; נקי, to be separated, pure (represented in Arab., Aram., Heb., and Assyrian).

(5) Of a vowel, a consonant, and a consonant, as אבד, to be lost, perish (Heb., Aram., Ethiopic) ; יכל, to contain, be capable (Heb., Arab., and Assyrian) ; ישר, to be right, prosperous (in all the dialects).

(6) Of three consonants, as ברך, to kneel, bless (in all the dialects) ; קדש, to be pure, sacred (in all the dialects) ; שלט, to be strong, to rule (in all the dialects).

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[1] In this classification a vowel is cited as an integral part of the root, only when it is original and determinate.

(7) Of four consonants. Noun-stems, as ברזל, iron (represented throughout the system), presuppose a true root; and פרשׂ, to spread out < פרשׂ, is perhaps Proto-Semitic, being represented in Hebrew and Arabic.

A root in any of these classes but the first and second may be secondary. In classes (4) and (5) probably all, and in class (7) certainly all, are secondary.

In the next Article we shall consider whether the morphological differences between the two systems of roots may be reconciled, and enter upon a comparison of the roots that may seem to invite such treatment.

(To be continued.)