II. MORPHOLOGY.

A. ROOTS AND STEMS.

THE FORM OF INDO-EUROPEAN WORDS.   § 80.

The Indo-European language is one of the highest mor-
phological regularity, since, besides the adjunction of sounds
indicating relativity, it is also capable of flexion, that is, of
regular variation of the root itself for the purpose of express-
ing relativity ; this variation of the root consists in the step-
raising of its vowel (§ 2). The addition of sounds expressing
relativity is found at the end only of a root, never at its be-
ginning (the augment is an originally independent word, which
only coalesces with the verb, and which can therefore disap-
pear without detracting from the force of the word). Every
Indo-European word actually employed in the language has
a sound expressing relativity after the root, which, moreover,
can also be reduplicated, e.g. *da-dā-mi* (I give) : naked roots
do not appear in Indo-European as words (secondary loss of
sounds expressing relativity naturally does not come under
consideration here).

The unique exception occurs in the vocative of those nouns
which possess no stem-formative-element besides their case-
suffix, as e.g. stem *vāk-* (speech, √*vak*, speak), nom. sg. *vāk-s*,
gen. *vāk-as*, etc., but voc. *vāk*. The vocative is, however,
no real word, no element of a sentence, but a word which has

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§ 80. assumed the form of an interjection, a gesture translated into sound. Very rarely (and even then due to relatively secondary processes) are relativity-sounds found in the root itself. This happens in the present form, as e.g. Gk. λαμβάνω, $\sqrt{\lambda a \beta}$ (ἔ-λαβ-ον), μ is here a relativity-sound of the present; Lat. iungo, $\sqrt{iug}$ (cf. iug-um), etc. The earlier forms had here also, probably, the nasal after the root-termination, v. post. 'Conjugation.' From this present-stem with medial nasal the nasalization has spread further to noun-stems (e.g. Gk. τύμπ-avo-v timbrel, $\sqrt{\tau\upsilon\pi}$ strike; Lat. iunc-tu-s, iunc-tura, $\sqrt{iug}$, etc.).

It is, therefore, a distinctive characteristic of the Indo-European language, that all words belonging to it have one and the same morphological construction; a regularly variable root and a regularly variable relativity-sound affixed thereto. The morphological formula for all Indo-European words is therefore $R^x s^x$ (v. Introd. II.).

§ 81. Root-formation. The earliest component parts of the Indo-European words are the roots. By 'root' we generally understand the meaning-sound, the sound that conveys the force of the word in question (as 'to be' is e.g. the root of as-mi I am, as-ti he is, etc.). But the stem- and word-formative suffixes also in Indo-European have arisen from originally independent roots by coalescence with other roots. Thus every Indo-European word may be treated as a whole which has gradually grown out of several roots, at the least out of two; of these roots one (the first) is the root of the word (in the narrower sense of the word 'root' in which it is generally used), and bears the meaning unaided, whilst the others have sunk to the subordinate position of relativity-suffixes to this chief-root, and have become welded on to it; e.g. as-mi (I am), $\sqrt{as}$ with meaning 'be'; the $\sqrt{ma}$, here weakened as a suffix to mi, expresses the relation of the 1st pers. (ma as an independent root means 'measure,' 'think,'

'man,' 'I ') ; *as-ti* (he is) √*as*+√*ta* 'that' dem., 'he'; *bhara-ti* § 81.
(he bears), √*bhar* (bear)+√*a*, here become a suffix, a root of
demonstrative function, and *ta* (as in *as-ti*) ; *vāk-s* (speech n.
sg.), √*vak* (speak), +√*sa* demonstrative, here shortened to *s*,
etc. In more simply constructed languages we can see the
early steps still preserved, steps which we must pre-suppose
in Indo-European (e.g. in the words adduced forms *as ma, as ta,
bhar a ta, vak sa*). Since the suffixes of the Indo-European
language arise thus from roots originally independent, it be-
comes clear why the suffixes, as regards step-formation, are
treated in precisely the same way as the chief-roots (e.g. *bhar-
-ā-mi* 'I bear,' with *a* of stem-formative sf. raised to *ā*, beside
bhar-a-ti 'he bears,' without step-formation ; *ta-nau-ti* 'he
stretches,' beside *ta-nu-masi* 'we stretch,' etc.). The exact
formula of the Indo-European word is therefore $R^x s^x$. We
shall now treat of chief-roots, meaning-sounds, alone.

We have not hitherto any accurate investigation into the
laws of root-formation in Indo-European. What sound-com-
binations occur in the roots of the Indo-European ? Could
roots change from one vowel-scale to another at a date as early
as that of the Indo-European original language? What exten-
sion of meaning is permitted by a root, and in what cases must
we assume original roots phonetically identical but nevertheless
distinct ? Several other similar questions hitherto unanswered
might be proposed in this place.

Meaning-sounds or roots (chief-roots) are generally separable
from the words which they now underlie. The Indo-European
roots seem in the first period of the life of the original language
to have possessed a sound-form still simpler than that shown
by roots existing in the actual language, cf. e.g. √*yu-g* beside
yu (join), *ma-t* beside *ma* (measure), etc. In such cases what
we see is probably the welding of a second root on to the first.
Original reduplication also appears, e.g. *ka-k* (cook), *gi-g* (live).
The origin of such secondary root-formations is in a great many

§ 81. cases due to the cohesion of the root and the addition which
originally formed the present stem, e.g. √*man* (think) from *ma*,
gan (be born) from *ga*, *bhandh* (bind) from *bhadh*, etc.; the nasal
originally characterizes the present stem only.   Hence we divide
roots into primary and secondary.

It is an invariable rule that Indo-European roots are mono-
syllabic.

There is no distinction, as regards form, between the so-called
verbal-roots (roots conveying a conception) and the so-called
pronominal-roots (roots expressing relativity) ; the roots *i, ka,
ta, ya*, e.g. are pronominal- as well as verbal-roots (*i* demonstra-
tive, go ; *ka* interrogative, be sharp; *ta* demonstrative, stretch ;
cf. Beitr. zur vergl. sprachforschung, ii. p. 92 sqq. 'wurzeln auf
a im Indogermanischen,' by A. Schleicher.   We get the root in
its fundamental-form when we have taken from a given word
all sounds expressing relativity and their possible influence
upon the radical sounds (a process generally easy, but some-
times scarcely possible), and reduced the root-vowel to its funda-
mental-vowel, whenever it appears in a raised form in the word,
e.g. *da* is the root of *da-dā-mi* (I give), *vak* of *vāk-s* (speech),
div of *daiv-a-s* (shining, heavenly, God), *dyu* = *div* of *dyau-s*
(heaven), *su* (bear, beget) of *su-nu-s* (son), *ta* of *ta-m* (him), etc.

Indo-European roots may be formed in any way provided
they are monosyllabic.   The following are the sound-combina-
tions of the root :—

1. Vowel, that is, accurately speaking, spiritus lenis+vowel,
e.g. *a* (dem. pron.), *i* (go), *u* (Sk. enjoy oneself, favour, Sclav.,
Lith., and Lat. ind-uere, ex-uere).

2. Consonant+vowel, e.g. *da* (give), *bhi* (fear), *bhu* (be).

3. Vowel+consonant, e.g. *ad* (eat), *idh* (kindle), *us* (burn).

4. Consonant+vowel+consonant, e.g. *pat* (fly, fall), *vid* (see),
bhugh (bend).

5. Two consonants+vowel, e.g. *sta* (stand), *pri* (love), *kru*
(hear).

6. Vowel+two consonants, e.g. *ardh* (wax), *ark* (shine; cele- § 81. brate).

7. Two consonants + vowel + consonant, e.g. *star* (strew), *stigh* (ascend).

8. Consonant+vowel+two consonants, e.g. *dark* (see), *vart* (turn).

9. Two consonants + vowel + two consonants, e.g. *skand* (scandere).

In the case of roots of the form consonant+a+consonant, or a+consonant, even when these forms arise through step-formation from u and i, there occurs frequently a transposition of the sounds, so that a comes to be final, e.g. *gan* and *gna* (know, be born); *mar* and *mra* (die); *ghar* and *ghra* (shine, be yellow or green); *par* and *pra* (fill); *ak* and *ka* (be sharp); i, raised to *ai*, and *ya* (go); *hu* raised to *hau, hav,* and *hva* (call), etc. Likewise *div* and *dyu* (shine).

Note 1.—Transposition of consonants such as is assumed by Alb. Kühn, über Wurzelvariation durch Metathesis, Bonn, 1868, e.g. in *vid* (see) and *div* (shine), Sk. *paç* (bind), origl. *pak*, and Lat. *cap* (take), etc., I cannot consider proved.

Note 2.—In a complete grammar of Indo-European this chapter ought to contain a full list not only of those roots which can be proved to be Indo-European, but also of those which are peculiar to individual divisions or families (fundamental languages) of the Indo-European language.

Note 3.—Hindu grammar, which is in this respect still followed by many European philologists, assumes no verbal-roots in *a*. Hindu grammarians mark roots ending in *a* either (1) in the raised form (e.g. *dhā* put, *dā* give, instead of *dha, da*), or (2) give to the root final *n* and *y*, which arise from the formation of the present stem, and therefore originally belonged to a suffix (e.g. *ǵan* be born, instead of *ǵa* ; *hvē* cry, instead of *hva, hu* ; *rāi* bark, instead of *ra*), or (3) mark them with ō, which obviously does no more than indicate certain peculiarities of these roots in forming their tense-stems, since in really existing forms ō nowhere appears (e.g. *çō* sharpen, for *ça, aç*). *Cf.* Beitr. ii. 92 sqq.

§ 82.   S t e m - f o r m a t i o n.   From roots arise w o r d - s t e m s
(themes), i.e. that part of a word which remains after we have
taken away the terminations of conjugation and declension.

Stems are formed :

1. By the bare root raised or not.   Since the root vowel
occupies a certain step in the sound-scale, it may always appear
as the substratum of a certain relation, and thus even by itself
express a relation.   This often happens in the case of verbs,
e.g. *ai-*, *i-*, present-stem and root (go), 1 sg. *ai-mi*, 1 pl. *i-masi ;*
as-, present-stem and root (be), e.g. 1 sg. *as-mi*, 3 sg. *as-ti*, etc.
This kind of stem-formation is less common in the case of
nouns, e.g. n. sg. *dyau-s*, loc. *div-i ; dyau-*, a raised-form from
dyu=div (shine), is here a noun-stem (heaven), and likewise a
root; *vāk-s* (speech), stem *vāk-*, is a step-form from $\sqrt{vak}$ (speak),
etc.   The expression of relativity by means of step-formation
of the root-vowel is symbolical.   Moreover the reduplication
of the root (with or without simultaneous step-formation), for
the purpose of expressing relativity, is of very early date, and,
like the simple root, suffices to form a stem, e.g. stem *da-da-* in
da-dā-mi, 1 sg. pres. ; *da-da-masi*, 1 pl. pres., $\sqrt{da}$ (give).

2. By additions made to the end of a simple or redupli-
cated root whatever step-formation it may occupy.   These
additions were (as we remarked in § 81) originally independent
roots, which, at an earlier period of development in the life of
the language, when the language consisted of roots alone, came
to be joined to other roots as defining elements ; these roots
expressing relation gradually lost their independence, and
became welded on to those roots which they helped to define
more accurately, e.g. *daiv-a*, n. sg. *daiva-s* (diuos, deus), $\sqrt{div}$
raised *daiv*,$+a$; *bhāra-ya-*, causative-stem fr. $\sqrt{bhar}$ (*bhāraya-ti*
he makes to bear), cf. *a* (pron. demonstr.), *ya* (relat.) ; *vak-ta-*,
n. sg. masc. *vak-ta-s* (dictus), $\sqrt{vak}+ta$, cf. $\sqrt{ta}$ (pron. dem.) ;
vi(d)vid-vant-, pf. part. act. of reduplicated $\sqrt{vid}$ (see)$+vant$,
etc.   Most of these stem-formative elements can be traced as

roots of general and weakened function, that is, as pronominal § 82. roots (thus e.g. *a, i, u, ya, ta, ka*, etc.).

Note.—By a hyphen - we indicate that the element with which it is used is always in that very place joined to another. Stem-formative suffixes are accordingly to be known by - at the beginning and end, word-formative sff. by - at the beginning (e.g. *vark-a-s* with sff. -*a*- and -*s*). The roots may, we think, be left uncharacterized; it would perhaps be more correct to write them with - at the end (e.g. *vark-*), but by leaving them thus uncharacterized we wish to distinguish them from those stems which may coincide with them in sound-form.

These are the methods of stem-formation from roots. The language, however, did not remain stationary, but further stems began to be developed from these stems which were sprung directly from roots. Stems of the former kind we call primary stems, and suffixes which are used for their formation primary suffixes; stems of the latter kind, which presuppose other stems for their formation, we call secondary stems, and the suffixes used for their formation secondary suffixes. The latter partly coincide in form with the primary suffixes. In the case of verbs, the same suffixes are added to the derived verbal-stems as to the underived, the verbal-stem being equivalent to a root, whether it be derived or primitive: it is, therefore, right to count all suffixes which are joined immediately to the end of verbal-stems (forming participles, nomina actionis, nomina agentis) as primary suffixes; e.g. -*nt*- (-*ant*-) in *bhārayant*-, pres. part. act. causative stem, is no less a primitive suffix than in *bharant*-, pres. part. act. of the stem-verb. On the other hand, comparative- and superlative-suffixes, diminutive-formations, etc., which presuppose complete noun-stems, are secondary, e.g. Lat. *dīu-īnu-s* stem *dīuo*- (dīuos); *facil-ior* stem *fac-ili*-, √*fac*; *doct-ior*- stem *doct-o*-, √*doc*; whence again comes the stem *doct-is-simo*-, in which form -*is*- is a comparative-suffix (cf. *doct-ius*), and -*simo*- = -*timo*-, f.f. -*tama*-, the compounded superlative suffix; the stem *doc-t-is-si-mo*- has thus

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§ 82. four stem-formative elements after the root.   Moreover, vowel-
raising may be combined with secondary stem-formation, e.g.
Sk. stem *dāiv-ika-* (n. sg. masc. *dāivika-s* godlike) stem *dēvá-*,
origl. *daiva-* (n. sg. *dēvá-s*, origl. *daiva-s* god).

The identity with pronominal roots of most elements used as
stem-formative suffixes, including the most common ones, *ta,
ya, ka*, etc., arises from the circumstance that this kind of root
(i.e. a root whose originally more concrete meaning has sunk
into a more general one, so that its meaning has been reduced to
a relation), by bearing a general meaning, has become service-
able for the more accurate definition of other roots which convey
more concrete meanings.

A further secondary means of stem-formation—one which is
essentially distinct from those already mentioned—consists in—
3. Composition of word-stems to form a new word-stem.
Composition is much employed in Indo-European languages.
(Cf. Ferd. Justi, über die zusammensetzung der nomina in den
Indog. sprachen.   Göttingen, 1861.)

Stem-formation by attachment of relation-elements is distinct
from composition in that it originated in the period of the
growing language, whereas composition does not occur till the
language is actually formed, presupposing, as it does, ready-
made word-stems as its materials.   Confluence or combination
of words is likewise to be separated from true composition: in
the case of the former words (i.e. elements of a sentence pro-
vided with terminations of case and person) become welded
together, while the latter compounds word-stems so as to form
a new stem.

Naturally this combination has not occurred till a later period
in particular languages, whereas composition must perhaps be
ascribed even to the Indo-European original language (the
archaic stems *svastar-* sister, *svakura-* father-in-law, e.g. are
probably compounded; so, too, must we assign to the com-
pound stems of the aor. and fut. a date as early as that of the
original language).

Prepositions and the augment before the verb form the com- § 82.
monest examples of combination or coalition of words once
independent in our languages; they are adverbs which have
grown on, i.e. they were originally cases, e.g. *abs-tineo* from *abs*
and *teneo*; *abs*, like *ex*, etc., seems to be a gen. case; the loose-
ness of the connexion shows itself in all cases, e.g. ἐκ-πίπτω
beside ἐξ-έ-πεσον, etc. Yet we find combination elsewhere also,
e.g. Lat. *quamuis, quamobrem*, etc.; German *frankenland* (*franken*
is gen. pl.), *wolfsmilch* (*wolfs* is gen. sg.), etc. Here the accent
is the only mark of the combination.

True composition has the power of expressing a relation; it
can give the new word a relation which is foreign to the com-
ponent parts taken separately, and which originates only in and
through their composition; e.g. μακρό-χειρ, *longi-manus*, i.e.
'whose hands are long, long-handed': here the possessive rela-
tion belongs to the composition; λογο-γράφο-ς 'word-writing'
=λόγους γράφων; *iu-dic-* (iudex)=*ius dicens* 'indicating, saying
justice,' etc. In the latter instances the former element of the
compound acts as a case, though it has no case-suffix. A fresh
relation of this kind can never be produced by combination;
for combination is nothing but varied and facilitated utterance
—nothing but union, by means of a common accent, of words
previously separate; it cannot therefore have anything in com-
mon with stem-formation.

An exhaustive statement of Indo-European stem-formation
does not lie within the range of this compendium, since it is
intended to embrace only what is indispensable for beginners
in comparative philology. The science of stem-formation is more-
over full of difficulties, and requires in parts a more detailed
discussion than can be contained in a work which is confined to
the narrowest limits possible. Of this wide range we select
therefore only a few parts, which we shall now proceed to dis-
cuss, viz.: 1. derivative verbal-stems; 2. noun-stems which are
most nearly connected with the verb, i.e. participles and in-

§ 82. finitives, and a few other noun-stems which are allied to these, or seem to be otherwise noteworthy; 3. comparative- and superlative-stems; 4. stems of cardinal- and ordinal-numbers. The last section, although of subordinate value for the explanation of the construction of language, is appended on account of the high interest of the numerals from other points of view. Hence under this last head we pass over the morphological arrangement, and direct our attention exclusively to the function, by discussing the separate numerals one by one irrespective of their phonetic expression.

Note.—It is obvious that here, in the chapter on morphology, if we had wished to be consistent, no regard should have been paid to the functions of stems, and that, since stems are not yet words, no distinction should have been made between verbal-stems and noun-stems. Likewise, the treatment of stem-formation should include the stem-forms of tenses and moods as well as all other stem-forms. The formation of verb-stems (in the widest sense of the word) does not, of course, belong to the statement of word-formation (conjugation), in which only the subject of person-terminations is to be treated, because the latter are the only elements which make the verb-stem a real member of a sentence, a word. However, in order not to divide the subject-matter in a way hitherto unusual, thereby rendering this work difficult to be used by students accustomed to earlier systems, we determine to leave the theory of tense-stems and mood-elements to the section 'Word-formation' (conjugation), and under 'noun-stems' (in Part II.) to refer now and then to similarly formed verbal-stems.

Hitherto we have no thoroughly scientific arrangement of Indo-European stem-forms. As regards Part II. of our fragmentary exposition of Indo-European stem-formations, in which we shall have to produce at least a fair number of stem-formative suffixes, we shall for the present follow the example of G. Curtius (De nominum Graecorum formatione, Berlin, 1842) in adopting a phonetic principle of arrangement; that is to say, we shall treat successively (1) stems without suffixes; (2) the simplest vowel-suffixes; and (3) suffixes having one or more consonants. Under the last head the suffixes *ya* and *va* will come first; after them suffixes with so-called liquids; and, finally, those whose chief element is a momentary sound,