gründliche tonale und syntaktische Analyse gewidmet hatte, bildet den Anfang des Johannes-Evangeliums. Im Deutschen lautet er ungefähr folgendermassen : „So hat Gott die Welt geliebt, dass er ihr seinen einziggeborenen Sohn gesendet hatte, damit alle, die an ihn glauben werden, nicht sterben, aber das ewige Leben erhalten" : //natikósèb (1) kyĕ Élóbà !hub-áibà kyė /nam, òb kyĕ //'ĕib di /kúisè !nái-hã̀ /kõ̃ábà kyė ma, //'ĕib !nà rà ≠kómn hoàn ka-//'ò títè sė, Xavèn nī /'ám-'ò 'ũ̃ibà 'ú-hã̀ sė.

50. Prof. SUNITI KUMAR CHATTERJI (Calcutta) : *Evolution in Speech Sounds.*

§ 1. The Indo-European speeches of the present day, although descended from a common mother-speech, represent, in their phonetics as much as in their syntax, the speech-habits of a variety of peoples who differ from each other both in race and in natural and social environment. The original Indo-European phonetic system (itself the result of development, through a large number of centuries, from its primitive or pre-historic form) seems to have suffered from a dislocation, at least among some sections of Indo-European speakers, some 4.500 years ago : the age of the **kentum/satəm** split cannot be laid down as being much anterior to 2500 B. C. The phonetics of Primitive Indo-European as the ultimate common ancestor of the ancient Indo-European languages like Homeric Greek, Vedic Sanskrit and Ancient Iranian (Old Persian and Avestan), Kanisian („Hittite"), Latin, Gothic, Old Irish, Old Kuchean („Tokharian"), Old Church Slav etc. has been on the whole satisfactorily established, thanks to the labours of linguisticians for over a century ; and although there cannot be unanimity of opinion in some matters of detail, the general character of the phonetics of Indo-European is now clear enough. From this Primitive Indo-European of say 3000-2500 B. C. to the Modern Indo-European Languages, we have a sufficiently authenticated history of phonetic change in what is now the most important speech-family of the world, considered from point of view of both numbers and influence.

The living Indo-European languages are derived from the same single speech, no doubt, but they show also the effect of the reaction of diverse races to the Indo-European language. Greek, Italic and Celtic are the results of modification of Indo-

(1) Die Tonhöhen sind hier nach dem System Christaller-Westermann bezeichnet worden. Siehe D. WESTERMANN, *A Study of the Ewe Language*, London 1930, S. 2. Für die Laute der Nama-Sprache habe ich mich bemüht das System der IPA anzuwenden.

European by the Mediterranean peoples ; similarly Classical Sanskrit and the Prakrits of Ancient India are largely the result of the attempt on the part of non-Aryan peoples of India, Dravidian and Austric, to assimilate the Aryan or Indo-Iranian form of Indo-European. The Nordic origin, at least the Nordic basis of Indo-European, is after all a hypothesis, which, so long as it is not established beyond doubt, must labour under the stigma of being more or less a subjective hypothesis : in the present stage of our ignorance of the original homeland and original race-type of the primitive Indo-European, Germanic can be also described as the result of the Nordic or North European reaction to the original Indo-European.

§ 2. Notwithstanding the diversity of development in phonetics and other sides of language induced by the racial factors in the different areas where Indo-European was established, there is a certain agreement in their lines of development among the various branches of the family, — particularly in phonetics — which is quite striking. The Aryan branch of Indo-European, to which Sanskrit and other Indo-Aryan languages belong, parted company from the Italo-Celtic and other European groups of the same family at least as early as 2000 B. C., if not earlier ; and yet we find Indo-European words showing a similar line of phonetic change leading to similar phonetic results in these two distant and long separated branches : e. g. Indo-European *septm̥ gave on the one hand sʌt: and sɑ:t in modern Indo-Aryan languages like Panjabi and Hindustani, and on the other it has been transformed to sɛt:e and sɛt in Italian and French ; Indo-European *kŭo:n gave ʃwɑn in Sanskrit on the one hand, and ʃiẽ in French on the other. **pt** > **t:**, **t**, and **k** > **ʃ** — these are parallel changes, two among many. If in the Indo-Iranian branch of Indo-European the so-called „palatal" (but in all probability a slighly advanced velar) **k** became a kind of **ʃ**, as in Indo-European *dekm̥ > *dɑʃɑ, *woikos > *waiʃɑs, *kmtóm < *ʃɑtɑm etc. (= *daśa, vēśaḥ, śatam*, in Sanskrit), the same thing is noticeable in the development of French from Latin : e. g. Latin **kɑbɑl:us**, Folk Latin *kjæβɑl:u > Old French **tʃɛvɑlə** > French **ʃval**, Latin **kaput** > French **ʃɛf**, **ʃɛ**, Latin **kampus** > French **ʃɑ̃**. Of course, the change took place much earlier in Indo-Iranian than in French : the one is perhaps 4,000 years old, the other barely 400. An Indo-European word like *qŭeqŭlos or *qweqwlos has given **sɑ:k** in Assamese, and a Latin **kwiŋkwe** has given **sẽk** in French (the Indo-European source of which, *penqŭe, has resulted in **pɑ̃s** in Assamese) : in both cases we have the change of an original guttural stop, **qŭ**, to the dental or alveolar sibilant **s**.

§ 3. If these and other changes in Indo-European are generalised and broadly classified, they represent the universal development during the last three to four thousand years of new sounds unknown to Primitive Indo-European. These new sounds are spirants, chiefly sibilants and affricates of different types. One might also lay it down that the general tendency has been to advance the articulation from the back of the mouth to the front — from the uvular and velar positions to the palatal and alveolar.

§ 4. The consonants of Primitive Indo-European are generally acknowledged to have been the following :

A. Stops, Aspirates ans Nasals :
Back Velars (probably Uvulars?) —
q, qh, g, gh, ŋ ;
The above, with lip-rounding („Labialised Velars") —
qŭ, qŭh, gŭ, gŭh, ŋŭ ;
Velars, or Advanced Velars (the so-called „Palatals") —
k, kh, g, gh, ŋ' ;
„Dentals" (probably Alveolars) —
t, th, d, dh, n ;
Labials —
p, ph, b, bh, m ;

B. Lateral-Alveolar : l ;

C. Trilled-Alveolar : r ;

D. Spirant (Sibilant)-Alveolar : s, which became z with voiced consonants ;

E. Semivowel : ŭ, ĭ = w, j.

In addition to the above, a fricative j has also been assumed ; and although some scholars have postulated the occurrence of some more spirants like θ, *đ*, ʒ, these are less likely to have existed in Indo-European.

The labialised gutturals or back velars qŭ, gŭ etc. resulted respectively in k — c or k — tʃ and g — ɟ, g — dʒ or g — ʒ in the *satəm* group of Indo-European (Indo-Iranian, Baltic, Slav, Armenian, Albanian); and in some of the branches in the *centum* group, e. g. Hellenic, Italic (Umbrian, Oscan), and Celtic (Brythonic), qŭ, gŭ feature under certain circumstances as p, b. This change gutturals to labial p, b probably points to a set of double-gest sounds kp, gb, such as are found in some of the West African languages, as being the ultimate source of the Indo-European labialised velars qŭ, gŭ in prehistoric Indo-European.

§ 5. The paucity of spirants, and the entire absence in the above sound-system, as reconstructed, of affricates and „advanced" consonants, i. e. of sounds of the English *ch*, *j*, *sh*, *zh* type, is quite striking. As yet the principle called *Zetacism* (change of k to ts etc.) was not manifest in Indo-European. But a frontal and a sibilantising pronunciation came into being in course of time — probably as early as the end of the third millennium B. C. in the Aryan (or Indo-Iranian) branch, and then in the archaic forms of Baltic-Slavic, Armenian and Albanian. The sounds k, kh, g, gh, ŋ' became in Indo-Iranian ç, çh j, jh, ɲ (here j = a strongly fricative voiced palatal sound), at least in the oldest period of Indo-Iranian, and then probably ʃ, ʃh, ʒ, ʒh, ɲ ; the labialised and simple back velars qŭ, qŭh, gŭ, gŭh, ŋŭ — q, qh, g, gh, ŋ fell together and became either simple velars („gutturals") k, kh, g, gh, ŋ' or palatals c, ch, ɟ, ɟh, ɲ ; and in Ancient Iranian, these were further modified — ʃ, ʃh, ʒ, ʒh becoming ʃ or s, s, ʒ or z, z respectively, and c, ch, ɟ, ɟh becoming similarly tʃ or ʃ, ʃ or tʃ, dʒ, dʒ ; and further, k, g from q, g, qŭ, gŭ changed under certain conditions to tʃ, dʒ. In Modern Persian, there has been a recent change of k, g in connexion with front vowels to c, ɟ, a revival of an ancient phonetic habit which had manifested in the ancestor of Modern Persian four thousand years ago.

§ 6. Similarly, in the other Indo-European languages of the *satəm* or Zetacising group, viz. Armenian, the Baltic and Slav languages, and Albanian, the change of guttural stops to palatal and dental sibilants and affricates took place quite early.

§ 7. In the other group of Indo-European, viz., the *centum* group, where sibilantisation and palatalisation were almost unknown in early times (barring the Greek change of groups like tĭ, dĭ, kĭ, gĭ to ss, z = zd, or dz, and the Italic Umbrian change of k to some kind of s or ʃ through influence of palatal vowels), Zetacism has come up during the last 1,500 years. Latin k, g in the company of front vowels have given tʃ, dʒ in Italian, tʃ, dʒ also in Old French (now simplified to ʃ, ʒ in Modern French). Sibilants, and palatal and other affricates, have developed from original Latin gutturals and dentals in the various Neo-Latin speeches. In a like manner, the same thing has taken place in the Germanic speeches : a comparison of the sound-system of Modern English, Dutch, German or Swedish with that of Primitive Germanic will at once strike one as presenting an approximation of Germanic to the phonetic habits of the *satəm* languages during the last thousand years. The Celtic tongues do not show this affricatising and sibilantising tendency to any remarkable extent, it is true ; but the palatal sibilant nevertheless has come into being in both Welsh and Irish, and the palatalised pronunciation of the velar, dental

and labial stops and spirants are a special feature of Goidelic Celtic (Modern Irish and Gaelic).

§ 8. Outside of Indo-European, the development of sibilants and palatal affricates is found to have occurred in historic times in Semitic, in Hamitic, in Bantu, in Tibeto-Chinese, and in most other speech-families.

The Primitive Semitic g had become ɟ in some of the ancient Arabic dialects, and this ɟ gave the Standard Arabic dʒ sound, which has now been further altered to ʒ in Syrian and Algerian Arabic ; and in Syrian Arabic, g > ɟ > dʒ > ʒ has further become ʃ. Original Arabic k has become tʃ in Syria, in Mesopotamia and in some parts of Arabia. The old guttural values of g, k are still maintained in some dialects of the Arabic of Egypt, however. Old Arabic uvular q, which seems also to be pronounced as a voiced sound g in some tracts or among some tribes, has become the palatal affricate dʒ in some cases in Najd and in ʿIraq.

§ 9. In the Hamitic family, Coptic developed tʃ and later ʃ out of older (Ancient Egyptian) g, q and k : before becoming tʃ, these sounds were probably fronted to c. Ancient Egyptian x was advanced to ʃ, and the velarised dentals tŭ, dŭ in some cases were palatalised to tʃ, ʃ.

Change of g to dʒ and of t to tʃ are found in some of the Hamitic languages other than Egyptian.

§ 10. In the Bantu family, there has been a like change of k and t to various kinds of ʃ, and to s, and of kj and tj to ʃ and s ; ŋk with the front vowel i or the palatal semivowel j has given rise to ntʃ, nʃ, ns, or nts, ts. Palatalisation and sibilantisation thus characterise the development of the Primitive Bantu velar sounds in the living Bantu languages.

§ 11. In the development of Northern (Peiping) Chinese from Earlier Chinese (the sound system of Earlier Chinese is better preserved in Southern Chinese), k and ts before a front vowel regularly became a kind of palatal affricate cʃ, which is found side by side with the retroflex affricate tʃ. The consonant system of „Ancient Chinese" of c. 500 A. D. was, according to the reconstruction by Karlgren, the following :

k kh gh ŋ x ɣ ;
kj kjh gj gjh ŋj xj ɣj ;
c ch ɟh ; cʃ cʃh ɟʒh ;
sj zj ɲzj ;
ʦ ʦh ʣh ʂ ;
t th dh n nj ;
ts tsh dzh ; s, z ; l, lj ;
p ph bh m ; pj pjh bjh, mj ; ʔ ; j.

Here we have a rich and varied number of affricates and sibilants ; but this richness is entirely derivative. In „Archaic Chinese" (of 800 B. C. to the time of Christ), there were c, ch, ɟ, ɟh, palatal stops and aspirates, which changed to affricates cʃ, cʃh, ɟʒh in Ancient Chinese, the affricates of this class being unknown in the former. Ancient Chinese c, ch, ɟ, ɟh as palatal stops and aspirates were originally tj, tjh, djh, dentals yodicised ; and the retroflex or supradental affricates and sibilants of Ancient Chinese, viz. ʦ, ʦh, ʣh, ʂ were derived from Archaic Chinese ts, tsh, dzh, s when these latter sounds had some special vowels after them (like ʌ and ɔ). Consequently, Archaic Chinese of pre-Christian times would appear to have possessed only these affricates : ts, tsh, dz, dzh, and the sibilant s only. As compared with Chinese of 500 A. D., Chinese of 500 B. C. was richer in stops (e. g. Archaic Chinese of 500 B. C. had initial g- and d-, which became j or zero in Ancient Chinese of 500 A. D. ; Archaic Chinese ɟ- became zj or ʒ ; the unaspirated affricate dz became the spirant z). Further spirants were developed in the T'ang period — e. g. f, from p, ph, bh of Ancient Chinese. Probably further researches into Pre-historic Chinese phonetics will reveal that even these affricates ts, tsh, dz, dzh of Archaic Chinese were derivative, and that Pre-historic Chinese was as free from affricate sounds as Primitive Indo-European.

§ 12. A survey of languages belonging to the different linguistic families of the world would certainly show, wherever a history of sounds can be traced, the development of various frontal sounds, fricative and affricate, from earlier velar or alveolar sounds. It may thus be allowed to infer that in the history of human speech sounds during the last 4 to 5 thousand years (which is after all a comparatively short epoch in the evolution of humanity), these frontal spirants and affricates are a recent development.

§ 13. It may further be laid down that plosives of various sorts were the characteristic sounds of ancient and primitive speeches, and that open consonants, generally, were of later origin. This can be more or less attested from the historical phonology of most of the language families. This is clear from the development of Germanic from Indo-European, of Avestan and Sogdian from Old Iranian, of middle Indo-Aryan (the later Prakrits) from Old Indo-Aryan (Vedic), of Spanish and partly French from Latin, of Ancient Chinese from Archaic Chinese, of Hebrew from Primitive Semitic, of Modern Greek, of Modern Tamil from Old Tamil, — in fact, from a host of other languages and dialects. The tendency to pronounce open consonants is exceedingly wide-spread, and although it is counterbalanced

by the development of new stops, it is an important factor in the evolution of Modern Speech as a whole, — a factor which was probably not so strong in primitive times.

§ 14. *The tendency to devoice voiced stops and other consonants* is another noteworthy thing in the evolution of human speech. This tendency was particularly at work in initial and final (i. e. non-intervocal) positions. The entire history of the phonetics of languages of the Tibeto-Chinese family during the last 1,500 years is an illustration of the principle of devoicing at work. In the Indo-European family, Germanic is marked off from common Indo-European by this devoicing of voiced stops, among other things, and the same tendency has persisted in the High German dialects. Armenian modifed the Indo-European voiced sounds similarly. to corresponding unvoiced ones at least 2,000 years ago. Old Kuchean (Tokharian) shows the same characteristic. In Scottish Gaelic, among Celtic languages, we have only voiceless stops, the old voiced ones having become devoiced. It appears also that New Persian has begun the devoicing of voiced stops, the original unvoiced stops now becoming strongly aspirated. Old Tamil developed out of Archaic Tamil during the early centuries of the Christian era in the same way. Korean, Javanese, the Mon-Khmer dialects, and a good number of American speeches all show the effect of this tendency.

§ 15. *Evolution of signific word-tones.* This matter in its historical development has not yet been fully enquired into, as we have just begun to collect and arrange the facts connected with sentence and word-tone in the living languages. But it is at least quite clear that tone is connected with the colour or timbre of consonant sounds, and it is intimately connected with phonetic decay or development ; e. g., the devoicing of voiced consonants. It has given rise to tone in certain languages : witness the tones of Panjabi, where deaspiration of aspirates and their devoicing have gone hand in hand with the introduction of the tone element in the word. Chinese had 8 (or really 4) tones as early as the 6th Century A. D., but how far with the full and complex phonetic system ~~of~~ „Ancient" and „Archaic" Chinese (retaining its voiced initials and its final consonants), these tones of Ancient Chinese were of signific value (and therefore indispensable elements of the spoken word), or were merely inevitable or resultant accompaniments of the consonantal element in the word, is perhaps impossible now to determine. It is likely that the loss of voice in consonants has been compensated for by the establishment, more emphatically or strongly than ever, of the tone, which has now become

in Modern Chinese a thing of paramount importance. This might be laid down as a general principle of phonetic development : the fuller and richer the sound-system (in consonants particularly), the lesser the need for signific tones : signific tones are a necessary corollary to extreme phonetic decay. This statement however is not to be taken absolutely, for there are languages like those of the Polynesian group (Maori, Hawaiian etc.) which have a minimum of phones without signific tones. Again, languages with comparatively fuller sound-systems have indispensable signific tones, e. g. Efik, Yoruba and other West African tone languages. The phonetic history of the languages of both these families or groups, however, is not known, but it may be presumed that the reconstruction of that history will not go counter to the statement made above.

Tone as a non-signific element in single words (apart from signific phrasal or compound-word tone) occurred in Primitive Indo-European, which was substituted by stress in the different branches of Indo-European from fairly early times (e. g. Latin, the Prakrits of Ancient India, Germanic). This extinct Indo-European tone was probably of emphatic origin — intensifying the meaning or force of a word rather than suggesting quite a different meaning ; it was not the result of phonetic decay in individual words : it was an ornament, not a compensation.

§ 16. In the matter of *Vowels*, too, human speech seems to show a development during the last several millennia.

As we all know, the Indo-European vowel-system as reconstructed shows a singularly simple set of vowels — e. g. a, e, o, with i and u as the result of semi-vowel offglides, a possible „neutral vowel" ə, and various very weak forms of the three basic vowels a, e, o. The system of vowels in Primitive Indo-European has only the normal vowels, with natural disposition of the lips ; — „abnormal" vowels, like front vowels with lip-rounding or back-vowels with spread-out lips, as well as central vowels (with the exception of ə) were unknown. But the various Indo-European speeches have in the course of the last 2,500 years, and particularly during the last 1,500 years, developed them, giving rise in the Modern Indo-European languages to a quite complicated set of vowel-sounds. Ancient Greek already in the 5th century B. C. shows an i with lip-rounding, an y ; in Modern French and German we have y, ø, œ ; and the vowels of many other Indo-European languages of Europe and Asia are no less complex.

Primitive Semitic is believed to have posssessed similarly only a, i, u, and the consonants contiguous to them probably infected them with a certain amount of nuance, but as yet

rounded front vowels and other modifications are absent in the vocalism of Semitic. The omission of vowels from Egyptian hieroglyphic writing and from the Old Phoenician script is probably connected with the paucity as well as extreme simplicity of the vowels in Ancient Hamitic and Ancient Semitic. Classical Arabic inhertited this simplicity of Primitive Semitic, and along with it the aphthongal tradition of Semitic (Phoenician) writing, which it passed on to languages like Persian, Turkish, Hindustani and Malay.

Primitive Bantu began with the same gamut of a, i, u which appears not to have undergone any violent changes, excepting that e, o, ɛ, ɔ have developed in the various Bantu languages.

Archaic Chinese vowels were simple enough, and in Ancient Chinese we have a number of diphtongs and triphthongs, but in Modern Chinese the vowels y, ø, œ have developed. The vowels of Tibetan show a great modification — all in the direction of y, ø, œ — from the simple vowels of Classical Tibetan of the 7th century A. D. which had only i e a o u.

An elaboration of the vowels (as the result of the introduction of lip-rounding or lip-spreading, of „breaking" through the influence of contiguous consonants, of epenthesis, umlaut and other phonological phenomena coming into play as the languages advanced in their history) would thus appear to be a characteristic of speeches at the present day, if we were to compare them with their earlier or primitive forms as preserved or reconstructed.

§ 17. *Loss of Clicks* unquestionably forms another landmark in the evolution of speech sounds. At present the clicks are found in most languages with an independent symbolic value. and stand out as interjectional expressions (e. g. the dental or alveolar click to indicate annoyance, the palatal click to urge a horse, the labial click in kissing, etc.). They occur as sounds entering into the composition of words in the Bushman and Hottentot languages, and in some of the Southern Bantu speeches where they are regarded as an imposition from Bushman or Hottentot, evidently through the assimilation of considerable numbers of speakers of these latter among the invading Bantu. The click sounds are probably to be looked upon as belonging in their function (if not in their formation — and this matter is well-worth investigating) to the grunts, croaks, squeaks and screeches and other „non-phonetic" sounds with which the speech of man started from the anthropoid ape stage. It would appear that the clicks were at one time spread over a much wider area (and probably among different races and language families) than now. Clicks in the midst of human speach sounds

(in a language, e. g. like Zulu) now appear so strange to those who are not accustomed to them that their presence in any appreciable number in the language as it is talked strikes as being suggestive of the noises — the clicks and the screeches — of lower animals, particularly birds. An early French Missionary speaks of the Bushmen (who have at least seven clicks in their language) as „clucking like turkeys". Herodotos (IV, 183) speaks of the cave-dwelling Ethiopians (hoi trôglodutai Aithiopes), a people living in the heart of Africa as he knew it, who lived on snakes, lizards and such like creeping things, that their speach was „like none other in the world", being like „the squeaking of bats". This has been taken to refer to the use of clicks in the speech of some primitive African people, either the ancestors of the present-day Bushmen and Hottentots or of some other group which has now abandoned the clicks as speech-sounds or has changed its speach. Of course, we cannot press too far this explanation of the comparison made by Herodotos of the speech of the cave-dwelling Ethiopians with the sound of bats, because elsewhere (II, 57) he suggests that the foreign (Egyptian) language spoken by an Egyptian priest carried off from Thebes in Egypt to Dodona in Epirus sounded to the Greeks like the chattering of a bird. The reference to foreign or unfamiliar races whose speech is not understood as „birds" is not an isolated thing in Herodotos. In the *Aitaréya Âraṇyaka* (I, 1, 1, 5), a pre-Buddhic Sanskrit work of probably 800-700 B. C., there is a passage which seems to say that the Vaṅgas, the Vagadhas and the Cerapâdas, aboriginal peoples of Eastern India and Bengal, were called „birds" by Aryan speakers from Northern India. However, the possibility of click-languages being spread over a wider area, at least in Africa, can reasonably be surmised from the passage in Herodotos about the cave-dwelling Ethiopians referred to above.

§ 18. The presence of a few implosives in (civilised) human speech at the present day is the survival of what may be described as „pre-language" or as the equivalent of speech in primitive man : a wreckage from a richer series, which became merely symbolic in language at large, and which probably at one time were the most easily available phonetic elements when language was forming — to be later on substituted by explosive and other sounds. Calls for domestic animals or birds which we find in different parts of the world now appear to be onomatopoetic formations, but these might originally have been clicks of various sorts, for which phones have gradually been substituted. The relation between the explosives and these implosive clicks, particularly in the matter of the possible

evolution (and not a mere substitution) of the latter for the former, is a matter well-worth considering.

§ 19. *Sentence Intonation, and gradual restriction of gesture or movement of limbs* as an accompaniment of spoken language, are other factors worth enquiring into. Herein possibly we have some very modern traits in the evolution of speech. Study of pitch in relation to the sentence has been taken in hand by phoneticians, and as yet it is confined to some of the more advanced languages. With regard to gesture as a speech accompaniment, it may be said that, although exceedingly picturesque, it is looked upon as a characteristic of „folk" or uneducated speech. It is deprecated, for instance, by the ancient Indian grammarians when they condemn gesticulation like shaking of the head as something bad in a reader or chanter. At the present day it appears that the restriction of gesture in speech is a characteristic of some of the more advanced peoples — e. g. the Germanic nations, the Chinese and the Japanese, among others. The personal equation, of course, is there, but over-gesticulation would certainly be regarded anywhere as a sign of bad breeding or bad education, and the desire to get rid of it altogether or to restrict it in speaking is undoubtedly a secondary development in the speech-habits of man, as yet not effective universally. Gesture and movements of the body or limbs were necessary when the spoken word (or the grunt or squeak or inarticulate cry which preceded the spoken word in the evolution of the expressive faculties of man) was not the perfect symbol (which it now is) of the idea of the action or the concrete object occurring in the mind of man. After the evolution of speech as we know it, it continued to be an adornment, superfluous, unnecessarily demonstrative and unnecessarily emphatic, which the more advanced groups among mankind would appear to be inclined to abandon.

§ 20. In enunciating the evolution of speech sounds, as in the suggestions made above, it must be admitted that there is considerable room for speculation. It is a far cry from 500,000 years from now to 4000 B. C. which date forms the *terminus ab quo* for most living languages and from which the history can be followed; and it will certainly be hazardous to opine about human speech prior to 7.000 or 10.000 years from now. Unless we knew absolutely for certain what the basic phonetics of the speech of „Urmensch" was, it will remain largely a mass of speculative possibilities. But if we do not know anything about the articulation of the „Urmensch", we know something about what is the equivalent of speech among the Anthropoid Apes, the nearest representatives of Pre-man

and his circle who came into being in the Middle or Later Miocene Age branching off from the Common Family of Ape and Man (the Dryopithecus-Sivapithecus Group) some 500,000 years ago. From various investigators who have studied the question (unfortunately, no trained phonetician has so far taken up this work), it appears that of the four kinds of anthropoid Apes — the Gibbons, Orang-utans, Chimpanzees and Gorillas — the Chimpanzee resembles Man most in the formation of its larynx. Nothing comparable to the human speech sounds is made by the Gorilla, the Orang-utan and the Gibbon, although „whimpering, crying, roaring, bellowing, grunting, screaming, chuckling, buzzing, humming, whining" and other terms have been used with regard to the sounds made by them. But a few vowel sounds, particularly the back vowel u, with some kind of guttural consonant g, k appear to be made by all anthropoid apes; and it is said that in one instance an Orang-utan was brought to say the English words *papa* and *cup*, and the sound of *th* = ð (Robert M. Yerkes and Ada W. Yerkes, *The Great Apes*, Yale University Press, 1929, pp. 164-165). In the case of the Chimpanzee, it has been stated that this primate possesses the „nearest approach to human vocalisation", producing many distinguishable sounds, and that we have in the Chimpanzee „the beginnings of speech, in effective vocalisation". Even one investigator has attempted to give a list of 32 words which were distinguished by her in Chimpanzee speech (Blanche Learned, working with R. M. Yerkes, quoted in the *Great Apes*, p. 304). It is interesting to note that these „words" are monosyllables, or are capable of division into monosyllables; and the consonants are almost all laryngals or velars, with one palatal semivowel — h, g, k, gh, kw, j, jh, — the exceptions being m and a consonant complex (or a click?) rendered as *vts*; and the Chimpanzee vowels which have been noted are a, o, u, ʌ, ai, ae, ue. Other observers have noted a preference for the back vowels u and o among Chimpanzees, as in the other apes. One investigator, Garner, tried to teach a chimpanzee pronounce *mamma*, but he was not successful; the French word *feu* fø was rendered by the chimpanzee as vʌ or βʌ and the German word *wie* vi: as something like wy; and an African word in the Nkami language, *nkgwe* „mother" = ŋgwe(?), according to this investigator, could be distinguished by the chimpanzee easily, although he could not pronounce the vowel correctly (*The Great Apes*, p. 305).

§ 21. The sequence of sounds in the articulation of the child when it is learning to speak will not be very much *à propos* here; but it is interesting to note that the first cries of the baby

do not embody the sounds which occur in human speech, and that the stops p b, t d, k g are generally among the earliest acquired by the child.

§ 22. It would perhaps be not regarded as too wild a speculation to suggest that since the beginning of human speech, the following line of evolution has characterised the history of its sounds, particularly during the last 5,000 years :

(i) A general fronting of pronunciation, from the back to the front palate, leading to the restriction of the gutturals and evolution of the palatals — of affricates and sibilants of this class particularly.

(ii) Evolution of spirants or open consonants of all sorts, including sibilants (excluding laryngal ones, which appear to be primitive sounds).

(iii) Simplification of double-gest sounds like kp, gb, which either were modified into kw, gw, or were split up into k, p, g, b.

(iv) Loss of clicks as speech sounds (clicks survive only as interjectional expressions in most speeches).

(v) Extension of vocalism from the guttural or back vowels (open and rounded) to frontal and central ones, and the development of „abnormal" vowels.

(vi) Devoicing of voiced stops.

(vii) Phonetic decay leading to the rise of word-tones.

(viii) Development of sentence intonation, with restriction of gesture and pantomime as accompaniment of speech.

51. Dr. P. DE V. PIENAAR (Johannesburg) : *Click formation and distribution.*

Formation

In dealing with the click sounds of the click speaking races of Southern Africa one has to bear in mind that the so called clicks really are compound phonemes, which consist of one or more acoustically different speech-sounds which have to be evaluated monophonematically. The first part of the phoneme is the suction release proper, whereas the second part may be of various acoustic qualities other than suction release noises.

This suction-release noise is generally known as the click sound and because of its independence of the breath stream these clicks-proper are grouped with the implosives of some African languages as rarefications, since the acoustic result of these two classes of speech-sounds is brought about by a rarefaction of air in an enclosed space and a subsequent release when air rushes into the partial vacuum causing :

(*a*) a surging of elastic air and the setting up of pressure waves (as, for example, with pre-palatal clicks) and/or,

(*b*) a friction noise as the release takes place slowly and air is drawn in to fill the partial vacuum (as e. g. with the dental click).

(i) In the case of the clicks the partial vacuum is created in the oral cavity, by shutting off the oral from the pharyngal cavity with a back of tongue plus velar closure, and, as regards the tip or blade lingual clicks, by closing the edge of the tongue against the upper molars, the tip or the blade being against some part of the alveolus or the palatum durum. Rarefaction is produced by drawing down the centre of the tongue by the action of the genioglossus, the vertical and the superior longitudinal muscles of the tongue. The release in front of the velar closure may take place medial-orally or lateral-orally. In the case of the bi-labial or labio-dental clicks the rarefaction of the cavity which has bi-labial or labio-dental, cheek, and back of tongue plus velum boundaries, is also brought about by a downward movement of the body of the tongue.

(ii) As for the implosives, the rarefaction occurs between a glottal closure, a velum plus pharynx closure and a closure somewhere in the oral cavity. The vacuum is created by a movement of tongue, pharyngal musculature and velum : with individual speakers the larynx as a whole may move downwards. Since with the implosives the supra-glottal cavity has a greater volume than is found where click rarefaction occurs, it follows that the acoustic result on the forward release will differ markedly from that obtained from a click.

Acoustic Result of the Forward Release

The click is usually named after the place where the forward release, resulting in the suction noise, occurs. The following types have been found and accurately described :

(i) Bi-Labial, or as variant } Both with a medial-oral release,
(ii) Labio-Dental } which has a fricative character.

Last-named is really infra-labio - supra-dental, and the lower lip may close against the gums of the upper teeth on the inside.

(iii) Interdental, with medial-oral release : the tongue-tip comes between the teeth and the blade closes against the upper gums. This is a variant of (iv).

(iv) Dental, with medial oral release. The tongue tip-blade touches against the upper gums and both (iii) and (iv) have a release of a fricative character.

(v) Alveolar, with medial-oral release. The blade of the tongue touches against the alveolus : the tongue is flattened and the