

3° *Le syndrome sympathico-vocal.*

Etant donné que le fonctionnement physiologique de notre vie neuro-végétative est assuré par de multiples excitations extérieures ou intérieures, toute altération en qualité ou en quantité de ces excitations entraîne obligatoirement des troubles divers par voie sympathique réflexe.

L'expérimentation clinique montre notamment que certaines perturbations de la vaso-motricité et du tonus des organes phonateurs relèvent de cette étiologie.

Il y a donc lieu de souligner que l'examen laryngoscopique, en nous donnant la certitude de l'existence d'un trouble vocal, ne nous en fournit pas toujours la raison.

4° *La valeur de l'immobilité d'une corde vocale au cours de la phonation.*

Comme suite aux recherches de MALJUTIN, STERN, WEISS, nous estimons possible actuellement d'envisager deux séries de faits :

(a) Dans la plupart des cas, la corde, immobile en apparence sur partie ou totalité de la tessiture, vibre cependant, mais à une fréquence différente de son congénère. Personnellement, nous n'avons constaté ce fait qu'en concordance de troubles vocaux ; aussi, nous lui accordons un intérêt majeur du point de vue diagnostique et pronostique.

(b) Dans certains cas pathologiques, la corde vocale apparemment immobile ne vibre pas ; à l'examen laryngoscopique non stroboscopique, elle présente un bord net alors que la corde opposée a un bord flou décelant la vibration.

En déduction de ces faits, nos conceptions générales en pathologie vocale ont obligatoirement évolué et nous permettent d'affirmer :

(A) *L'existence d'une pathologie vocale d'ordre mécanico-acoustique.*

Conformément aux lois d'unité et d'interdépendance des organes phonateurs que nous avons énoncées en 1931, un grand nombre de modifications de la vibration des cordes vocales ne s'expliquent que par une perturbation des forces motionnelles et réactionnelles assurant l'équilibre dynamique de cette vibration.

Les troubles *motionnels* résultent de l'entretien défectueux de la vibration des cordes vocales sous l'action de la pression sous-glottique.

Les troubles *réactionnels* sont l'expression du désaccord entre le résonateur pharyngo-buccal et le vibreur laryngien. Ce désaccord donne lieu à une réaction aggravée qui entrave la vibration des cordes vocales et fait naître dans le larynx des suppléances musculaires compensatrices.

En conséquence de ces deux sortes de troubles, certaines myopathies laryngées prennent naissance, et peuvent, dans certaines conditions, aboutir à la formation du nodule.

(B) *La production de fréquentes altérations vocales par des affections somatiques diverses (humorale, gastro-intestinale, endocrinienne, amygdalienne, nasale, etc.).*

Les incitations sensibles adultérées, en provenance d'un trouble organique quelconque, peuvent déclencher un arc réflexe qui, trans-

mis aux organes phonateurs par la voie neuro-végétative, altère leur vaso-motricité et leur tonus musculaire.

L'existence d'une pathologie *sympathico-vocale réflexe* est confirmée par la guérison du trouble vocal, après traitement rationnel de l'affection causale, alors que toute médication appliquée aux organes phonateurs se montre inefficace.

(C) *La valeur qui s'attache aux variations de la chronaxie et du tonus des cordes vocales.*

Entre l'état paralytique et l'état normal, il y a place pour toute une gamme de perturbations nerveuses rarement reconnues. Le chapitre des *akynésies* et des *dyskinésies* apporte à la compréhension des troubles vocaux de cette étiologie, une classification logique et de précieux enseignements.

(D) *L'obligation de supprimer l'appellation de "trouble fonctionnel" et de toujours connaître la cause organique efficiente de toute perturbation vocale (souvent très éloignée des organes phonateurs), parce qu'elle seule permet la mise en œuvre d'une thérapeutique causale.*

(E) *La révision de la terminologie usitée.*

Ainsi, la notion de "*malmenage vocal*", vague et insuffisante. Si un mécanisme vocal est défectueux, il faut préciser *en quoi* et *pourquoi* il l'est, et *par quoi* il faut le remplacer.

De même, la donnée de "*raucité vocale*", qui, exprimant une altération du timbre, n'a pas une valeur clinique suffisante. La raucité n'est qu'un symptôme d'ordre assez général, et rien de plus.

Le terme de "*rhinolalie fermée*" est également impropre, parce qu'antithétique. Peut-on dire "parler du nez" alors que la voie nasale est close ?

Enfin, certaines spécifications non fondées sur les lois physiques ou sur l'étude bio-physiologique et pathologique sont d'une imprécision regrettable. Ainsi, par "*phonasthénie*", "*fatigue vocale*", etc., on exprime des états pathologiques trop imprécis, qui n'acquiescent de sens médical qu'avec l'adjonction de propositions complémentaires étiologiques et pathogéniques.

En définitive, nos recherches nous ont imposé une conclusion impérative :

La pathologie de la voix ne peut être considérée comme une entité médicale isolée et particulière. Elle doit s'intégrer dans le cadre de la biologie, de la physiologie et de la pathologie générales.

17. Prof. MILES L. HANLEY (Wisconsin) : *Phonographic recording.*

Phonographic recording is rapidly becoming an indispensable tool for research. Conventional transcriptions cannot adequately represent the unusual intervals of folk music, and many of the important characteristics of speech, such as voice quality, intonation, distribution of stress, speed and rhythm of utterance. Written records, however good, must contain a personal and subjective element.

Without some objective check their use requires an act of faith—faith that the field worker has heard accurately, that he has been able to translate what he heard into symbols, and that we know just what he means by his symbols. Phonograph records not only provide such a check, but they constitute a permanent archive of material which may be consulted and studied in the future.

After the invention of the phonograph in 1877 its obvious advantages to the linguist, the folklorist, the ballad collector and the anthropologist were promptly recognized by European scholars. The Vienna Phonogramm-Archiv was founded by SIEGMUND EXNER in 1899, and the Musée Phonétique by AZULAY in 1900. Since then many other collections have been established: a second one in Paris, two in Berlin, and others in Cologne, Lübeck, Frankfurt, Leyden, Oslo, and Zurich. In America, although our scientists have made great advances in the mechanical technique of recording, our scholars have been slow to see the possible uses of this tool. It is true that some folk song and American Indian material has been collected in the past, but mostly by the unsatisfactory methods of cylinder recording or magnetic recording. So far we have nothing in America that could be called even the beginning of a central Phonogramm-Archiv, but we do have some important collections and many more are in prospect. A few of these are: Prof. GRET's American Speech records, which have been made at Columbia during the last ten years, the folk songs collected by JOHN A. LOMAX, the Gullah negro records made by Dr LORENZO D. TURNER, and the records of New England speech made for the Linguistic Atlas of the United States and Canada.¹

Sound Recording Methods²

In all kinds of electrical recording, sound-waves (periodic variations in pressure) produce mechanical movements—usually in a sensitive diaphragm. These movements are translated into corresponding electrical vibrations or variations which (usually after amplification

¹ See the *American Council of Learned Societies Bulletin* no. 23 for June 1935, especially Prof. MILMAN PARRY's "Oral Poetry of the Southern Slavs", pp. 30 and 98; Prof. HERSKOVITS' "Transcriptions of West African Music", p. 125; and the reports on the Linguistic Atlas collection, pp. 22 and 87.

² For a full and authoritative discussion with excellent bibliographies see *Technische Akustik*, ed. E. WAETZMANN, 2 vols. Leipzig, 1934. (These two volumes form Bd. xvii of the *Handbuch der Experimentalphysik*.) An excellent and readable book on film and disc recording is *Talking Pictures* by BERNARD BROWN, 2nd (revised) ed. London, 1933 (Isaac Pitman). A compact and useful practical book is *Home Recording and All About It* by GEORGE J. SALIBA, New York, 1932 (Gernsback). *Sound Projection* by RUDOLPH MIEHLING, New York, 1929 (Mancell Pub. Co.), while less up to date than the other books mentioned, may be found useful. An abstract of G. OSCAR RUSSELL's *Mechanical Recording of Speech* appears in *Bulletin* no. 4, *Ling. Soc. Am.* Sept. 1929. A brief essay by H. A. FREDERICK, "Recording and Reproducing Sound," appears in *The Review of Scientific Instruments*, vol. v, no. 5 (May 1934). A discussion of recording materials is found in E. NESPER, *Nimm Schallplatten Selber Auf!* (Stuttgart, 3rd ed. 1932) and in the essay by H. A. FREDERICK referred to above. See also the *Journal of the Acoustical Society of America*, *The Review of Scientific Instruments*, and *The Bell Technical Journals*.

by vacuum tubes) produce mechanical movements in a second diaphragm or a moving armature of some type. Electrical variations may be translated into light variations (sound on film) or into magnetic variations (Telegraphone, Blattnerphone). In the familiar phonographic technique, the sound vibrations are translated into mechanical movements of a stylus which cuts or embeds a groove in a disc, cylinder, or strip of motion picture film.¹ The groove may be of constant depth, recording lateral swings of the stylus (lateral cut, "snake track", Berlinerschrift) or of varying depth (hill and dale, Edisonschrift). Hill and dale recording is used in dictating machines and in some very high quality studio recording, but lateral cut records are most practical for common use at the present time.

The recording methods referred to in the preceding paragraph may be classified as (1) Photographic, (2) Magnetic, (3) Mechanical. Since the particular kind of mechanical recording known as instantaneous recording on disc will be used in most research projects, the first and second will be dismissed with a few brief remarks.²

1. *Photographic*. In this method electrical variations produce corresponding light variations, which in turn produce either a varying amount of exposure (variable density, Western Electric) or varying area (variable width, R.C.A.) on a photographic film. Equipment for this method can be easily portable and can be used under extreme climatic conditions, but the record cannot be played back at once. According to Dr H. A. FREDERICK, duplicates, even commercial ones, show considerable variations from print to print. "Such duplicate records have thus far failed to show as great uniformity as disc record pressings. The individual film records are expensive, delicate, bulky and difficult to handle compared with disks."³ In contradiction to this statement it has been pointed out that duplicate prints produced by the large film companies are now fairly constant and that variations are mainly in the range above four thousand cycles. The fact remains that it would be difficult for the ordinary research worker to get copies of any such quality. The excellence of film recording is unquestioned, but the expense of this method is prohibitive for most research projects.⁴

2. *Magnetic*. In this method electrical variations produce variations in the degree to which a magnetic wire (Telegraphone) or steel tape (Blattnerphone) is magnetized across its axis. This method requires special equipment and is not much more satisfactory than

¹ This last method, much in vogue in France, is not to be confused with the familiar moving picture technique, in which light variations are photographed.

² For technical information I am indebted to the expert knowledge of Mr LINCOLN THOMPSON of the Sound Specialties Company, Waterbury, Connecticut. He is not, of course, responsible for any faults in the present account, much of which is inexpertly condensed from his full and explicit discussion. I have also used a number of valuable suggestions from Mr S. K. WOLF, Acoustic Consulting Manager of Electrical Research Products, Inc.

³ H. A. FREDERICK, *Rev. of Sci. Inst.* vol. v, no. 5, p. 181.

⁴ A photographic sound track may be put on disc. Such a record is of excellent quality and free from surface scratch because there is no surface contact. However, the method is not practical for most purposes and it is impossible to get more than two minutes of recording on a disc of ordinary size.

cylinder recording. Duplicates cannot be made, though of course it is possible, with special equipment, to dub the record on disc or film. The great disadvantage of the magnetic method is that, with the alloys now available, a wire or tape soft enough to record sensitively loses its magnetism in a short time.¹

3. *Mechanical.* Mechanical methods include cylinder recording, scratching on motion picture film, studio recording on wax, and the various instantaneous disc methods.

Cylinder recording may safely be excluded. It is almost as expensive as disc recording, and much less satisfactory. The records are fragile, insensitive to high frequencies, difficult and expensive to duplicate, and quickly worn out by use.²

Recording by means of grooves scratched on motion picture film has not, so far as I know, been tried very extensively in this country. The material is not expensive, since discarded picture films may be used, but duplication is difficult and special apparatus is needed both for recording and playing. I have heard that there are difficulties in keeping the films flat and constant in velocity. The recording medium, celluloid or cellulose acetate, is also open to objections which will be discussed under disc recording.³

Since most of us require records that can be made in the field and paid for from limited funds, studio recording on wax is usually out of the question. But if the material can be recorded in the studio and expense is no object, records can be made of a perfection that would have seemed miraculous five years ago. In studio recording, the groove is cut in a soft "wax" (really a mixture of metallic soaps). "The surface of the wax, after being thus engraved, is rendered electrically conducting. This can be done in a number of ways, such as dusting with graphite or bronze powder, sputtering with gold or silver in a cathode chamber, or by the chemical precipitation of silver."⁴ The wax is then electroplated with copper and a "master" made. From this "master" or negative, records may be pressed, though in commercial practice, where many pressings are to be made, a "mother" is electroplated from the "master" and from that, one or more "stampers", that the master negative may not be worn out. The layman who does not understand the delicacy and difficulty of recording on a studio wax should see the process, or read a detailed account (e.g. that in BROWN's *Talking Pictures*, cited above).

¹ A magnetic steel tape recorder recently built by the Bell Laboratories is said to give much better quality than cylinder recording. They also have tapes which are said to retain their magnetism indefinitely.

² Unfortunately most of the field recording done in the past has employed some kind of cylinder recording on the principle of the Edison Phonograph, and a great deal of valuable material is so preserved. It is to be hoped that no one hereafter will use such methods, but those who have cylinder records may be interested to know that they can now be electrically re-recorded on discs in America or Germany.

³ Direct cutting on the edge of a film has also been experimented with at various times. This method has obvious advantages for synchronizing sound and picture film. A development of this method known as the Spoor-Lindberg system has been tried in Chicago, but I have no first-hand knowledge of it.

⁴ H. A. FREDERICK, *Rev. of Sci. Inst.* vol. v, no. 5 (May, 1934), p. 176.

What might be called "semi-studio" recording has been tried by the Lautabteilung of the National Library of Prussia and by the Royal Irish Academy.¹ Portable apparatus for recording on studio wax exists, but it is much more cumbersome than apparatus for instantaneous recording and is open to many serious practical difficulties.

The remainder of this discussion will be devoted to instantaneous recording on disc. There are three kinds of methods: (1) those using a pregrooved record; (2) cutting; (3) embedding.

(1) Pregrooved records have been widely used in home recording. There are two methods: In one the stylus point drops into the centre of the pregroove, and produces a groove within a groove; in the other the stylus point fills the pregroove and produces undulations in it. The discs are expensive, but when a small amount of recording is to be done and high quality is not required, this method offers great advantages, since the ordinary pick-up arm is used and no feed for the cutting head is required. Very good records may be produced with this method by using a special turntable and powerful motor, but in this case the added cost of discs and special equipment is such that one might as well have provided a turntable feed in the first place.

(2) Instantaneous recording by cutting is similar to wax recording in that an actual chip is removed from the disc. Compositions of gelatin, celluloid, or cellulose acetate are generally used. Gelatin is sensitive to moisture and deteriorates with age. Celluloid is inflammable and cellulose acetate less satisfactory in quality than celluloid. "Metallophone" discs, made in Germany, produce excellent results, but the price is very high, especially for the twelve-inch discs. A new principle is employed in the Draloton disc, also made in Germany. The recording is done on a soft "bakelitartiges" material, which is afterwards hardened by baking. The baking process, which does not injure the original record, makes it playable with a steel needle. But the Draloton disc requires considerable skill on the part of the operator, must be kept fairly cold, and deteriorates rapidly with age. For these reasons it is not a suitable material for field recording. The Presto Recording Company of New York markets a disc somewhat similar to the "Metallophone", which they claim to be even better. The records, however, are just about as expensive. A steel needle of a special type is used in reproduction. Under ideal conditions, the special discs referred to give considerably better results than aluminum, but since most of them are sensitive to heat or atmospheric conditions, or deteriorate rapidly with age, they are, on the whole, less suitable for field work than aluminum. The Marguerite Company of London uses a similar disc which has a smoother surface than the Presto, but is otherwise open to the same objections

¹ See *Royal Irish Academy Abstract of Minutes, Session 1928-29, Appendix*, pp. 19-29; *Proceedings of the Royal Irish Academy, 1930-31*, pp. 20-26; *ibid.* 1931-32, pp. 25-31; and Dr MYLES DILLON, "Report of a Linguistic Survey Recently Carried Out in Ireland", *Atti del III Congresso Internazionale dei Linguisti* (Roma, Settembre 1934, xii).

and requires a special trailing needle. An excellent disc of similar type has recently been perfected by the Sound Specialties Company of Waterbury, Connecticut. The disc is coated with a kind of cellulose acetate lacquer which hardens slowly with time. It may be played with any ordinary steel needle.

An important objection to the cutting method is that no provision is made for removing the long spiral chip, which tends to curl around the stylus. In studio recording the chip is withdrawn by a suction pipe as fast as it is formed. Both the styluses and cutting media available at present tend to be erratic. The same objections apply to records scratched on either nitrate or safety film.

(3) In the embedding method the stylus is fed across the disc at a uniform rate and presses a groove into the disc, which has been treated with some lubricant to reduce surface noise. Machine oil or axle grease is satisfactory, but the cleanest and most permanent lubricants are waxes, e.g. paraffin. The ordinary aluminum disc has a hard surface and requires a heavy weight on the recording head. It is obvious that additional sensitivity could be secured by the use of a softer medium and a lighter weight cutting head. For this purpose discs softened by annealing have often been tried, with varying results. If annealed too rapidly, discs tend to curve and to record unevenly. Discs annealed slowly in oil, however, keep their original stiffness and produce better records. Apparently they will stand as many replays with fibre needles as the harder discs.¹ A special sapphire play-back needle may be used on aluminum discs and gives excellent quality without injuring the records. Such a play-back needle, however, must be made to fit exactly the groove in which it is to be used. Consequently the records made by different machines will require different play-back needles.

Field Recording. For field recording prime requisites are portability, ruggedness, economy and simplicity of operation. Other requirements will vary with individual projects. Almost all methods known to me have been mentioned, but in my opinion the most suitable for most projects is disc recording on annealed aluminum.² It allows for satisfactory quality with simple operation, relatively low cost of equipment and materials, ease of storage, simple and accurate duplication. Single copies may be re-recorded on aluminum at slight cost, but if more and better copies are required, a metal master from which standard type records may be pressed may now be made by direct galvanic processes at a cost of under \$10.00 for the making of a twelve-inch master and several pressings.³ Portable outfits

¹ Persons using discs in quantities of 500 or less will probably continue to buy from agents as heretofore. Those who use many discs can effect considerable savings by having the purchasing agents of their universities buy the discs directly from The Aluminum Company of America.

² The coated discs referred to above are very much better than aluminum and should be used wherever possible. But for field recording where the source of supply is remote and discs must be carried for periods of several weeks, the aluminum is safer and not so likely to make trouble for the inexperienced operator.

³ I should be glad to lend a copy of such a record to anyone interested.

ranging in cost from \$225.00 to \$1100.00 are now on the market. The finest portable equipment I have seen is that provided by Harvard University for Prof. MILMAN PARRY's expedition to Yugo-Slavia.

Power Supply. When dependable alternating current is available, it is, of course, the most convenient source of power. Otherwise batteries must be used. Some weight may be saved by the use of a powerful spring motor for operating the turntables, but in any case batteries are needed for the amplifiers. When working in New England I used a combination set, with which I could record on D.C. or A.C.

Microphones. The familiar one-button carbon microphone is inadequate for good recording, since it performs accurately only within a very small frequency range; but the best quality two-button carbon microphone, for example, the Western Electric 600A, gives a fairly uniform response. A good carbon microphone is satisfactory when the speaker stands fairly close to it so that small amplification is required; otherwise the unavoidable carbon hiss will produce a swishing noise in the record. The dynamic, crystal, ribbon, and condenser types require more amplification than the carbon microphone, but have no extraneous noise. The condenser is excellent in quality, but since it is sensitive to moisture and requires particular care, it is unsatisfactory for field recording. I have had no field experience with the new crystal microphone, but have heard very good reports of it. The choice between the dynamic and ribbon or velocity type depends on the nature of recording to be done. The ribbon or velocity microphone is highly directional, that is, picks up the sound coming from directly in front of it or directly behind it. This feature is often an advantage, since background noise is largely eliminated. The dynamic and crystal microphones are not so directional and are suitable for several speakers. Until recently the expense of good dynamic microphones has been prohibitive, but excellent ones may now be obtained at a cost of under \$100.00. For most purposes the dynamic microphone is to be recommended.¹

For aluminum recording it is best to use a pre-amplifier, for it is then possible to strengthen the frequency response at the point where aluminum is poor, namely above 3500, with a consequent gain in clarity.

The present discussion has been largely concerned with recording in the field, but there are many other practical uses of recording equipment. In laboratory experiments dealing with sound, it is possible to record simultaneously the sounds studied.² It is very

¹ Though the velocity microphone has been used effectively in broadcasting studios, I should not recommend it for field recording. The directional feature is a disadvantage with inexperienced speakers, who frequently move about or turn their heads, and the low frequency response is so strong that unless a special filter is used, there is great danger of the fault known as "over-cutting".

² See HARRY H. HALL, "A Recording Analyzer for the Audible Frequency Range", *Journal of the Acoustical Society of America*, VII (Oct. 1935), 102-10. Records have been kept of all speech sounds analysed by Dr HALL's instrument.

easy to make excellent records of radio programs either as received or as sent out from the studio. Many important broadcasts are now so preserved. There are many obvious educational applications, among them teaching the pronunciation of foreign languages, testing musical aptitudes, correcting speech defects, adding sound effects to silent films, and, thanks to the process of hearing by bone conduction, in teaching the deaf.

Instantaneous recording with the latest type of discs opens up many hitherto unrecognized possibilities. Recording done with two turntables may be perfectly continuous, so that material in any quantity is recorded as it is produced. With a good transcribing instrument, such as is now available, one may play such records, localizing exactly the material of interest to him, and re-record on a new disc. Re-recording in the past has commonly meant serious loss in quality, but with the new coated discs, excerpts are almost indistinguishable from the original. This fact is of great advantage in dealing with folklore, ballad material, or anything produced by a naive speaker, who cannot be expected to give a rehearsed and timed performance. The material may be edited and even rearranged.

18. Dr E. FEUCHTWANGER (Munich): *Zu den Problemen der Restitution von Aphasien und Amusien.*¹

Wie bei allen Krankheitserscheinungen gehört auch bei den Aphasien und Amusien nach umschriebenen Gehirnschädigungen zur Diagnose nicht nur die Feststellung eines momentanen Befundes, sondern auch das Urteil über die Prognose, d. h. über die Aussicht auf *Restitution* der Funktionsstörungen. Eine *allgemeine Prognostik* ist heute nicht mehr wie bisher nur aus den Erfahrungen von Einzelfällen zu erreichen, sondern bedarf trotz der grossen Variabilität der aphasischen und amusischen Erscheinungen der Untersuchung an einer grossen Zahl von Fällen.

Aus 308 Krankengeschichten von Apathikern der (medizinisch, heilpädagogisch und fürsorgerisch arbeitenden) Hirnverletztenabteilung der Heckscher Nervenheil- und Forschungsanstalt in München wurden 178 Aphasie- und Amusiefälle für die Bearbeitung der Restitution herangezogen. Um ein Urteil über die *Art* und das *Ausmass* der Restitution zu gewinnen, wurde folgende Einteilung getroffen: Vollrestituierte, Gutrestituierte, Teilrestituierte, Schlechtrestituierte und Nichtrestituierte. Durch statistische Abschätzung der Gruppen und ihrer Merkmale gegeneinander und gegen die Gesamtheit der herangezogenen Aphasiefälle wurden Resultate über die die Restitution begünstigenden bzw. hemmenden Faktoren und über die Verlaufsmerkmale der Restitution zu erreichen gesucht. Die günstigsten und ungünstigsten Fälle stellten je 1/10, die guten und mittleren Restitutionsfälle 4/5 des Materials dar. Das allgemeine Ausmass der Restitution erwies sich als sehr gross, das Erreichen der Vollrestitution dagegen beschränkt. Am günstigsten liegen, wie zu

¹ Aus der Heckscher Nervenheil- und Forschungsanstalt München, mit Unterstützung durch die Rockefeller Foundation.

erwarten, die aphasischen Fälle, bei denen das Gehirn vor der Schädigung gesund war, bei denen weiterhin der Schaden nur eng umschrieben im Bereiche der Sprachregion bleibt und nicht auf andere Funktionsgebiete (das optische, frontale usw.) übergreift, und bei denen die sprachlichen Wirkungsstellen (BROCA'sches, WERNICKE'sches Feld usw.) nur indirekt, nicht direkt in die Schädigung einbezogen waren. Auch die Schädigungen der der wirksamen Hemisphäre entgegengesetzten Hirnhemisphäre (rechte Hirnhemisphäre beim Rechtshänder usw.) liegen restitutiv natürlich wesentlich günstiger. Die Fälle sind also in bezug auf Restitution am besten, bei denen Heilung und Funktionserstärkung der betroffenen Sprachhirnpartien, Substitution der geschädigten Funktionen durch die symmetrischen Teile der anderen Hirnhemisphäre und Kompensation durch andersartige Funktionsgebiete (z. B. das optische) sich am leichtesten vollziehen. In bezug auf das *Alter* zur Zeit der Schädigung besteht die Regel, dass zwar jüngere Lebensstufen begünstigt sind, dass aber auch ältere Geschädigte bei sonst günstigen Umständen gute Restitutionsresultate ergeben. Die *Geschlechter* weisen nach unserem Material keinen Unterschied auf. Über den *Zeitpunkt des Beginnes und des Endzustandes sprachlicher Restitution* ergibt unser Material folgende Zahlen: Durchschnittlicher Beginn zwischen der 2. und 8. Woche nach der Schädigung; frühzeitiger Beginn der Restitution ist ein günstiges Zeichen, späterer Beginn keineswegs immer ungünstig. Bei dem grössten Teil (über 40 %) tritt zwischen dem 5. und 7. Jahr nach der Schädigung keine Besserung mehr ein. Endzustand der Restitution, bei einem kleinen Teil (10 %) sogar erst nach dem 8. Jahr. Bei dem grössten Teil der Vollrestituierten ist die Restitution schon vor dem 3. Verletzungsjahr erreicht. Ein zu vorzeitiges Urteil über die Restituirbarkeit einer Aphasie ist mithin nicht erlaubt. Die *Schwere der initialen Sprachstörung* (totale oder partielle Sprachstörung) gestattet kein Urteil über den Verlauf der Restitution.

Unter den *Aphasieformen* sind die sensorischen Aphasien in Bezug auf Restitution günstiger als die motorischen, unter den motorischen wiederum die partiellen (subcortical-motorischen, rein-wortstummen) Aphasien im Durchschnitt günstiger als die total-motorischen (corticalen) Fälle. Doch finden sich totale und partielle Formen unter den Vollrestituierten, den Teilrestituierten wie auch unter den Schlecht- und Nichtrestituierten. Das Gleiche gilt für die sensorisch Aphasischen. Ein "Alles-oder-Nichts-Gesetz", wie früher gelegentlich angenommen, gilt für die Aphasierestitution nicht.

Die *einzelnen Sprachanteile*, die durch die Aphasieuntersuchung isoliert werden, haben in der Restitution nicht das gleiche Schicksal. Dies wurde an gutrestituierten Apathikern, bei denen die Spontansprache ganz oder fast völlig wiederhergestellt war, studiert. Der Häufigkeit nach wurden an diesen Fällen noch lange Zeit Störungen angetroffen bei folgenden Leistungen: akustisch-sprachliches Gedächtnis (Merken und Lernen), Nachsprechen, Wortfindung, Lesen, Schreiben. Die *akustischen Gedächtnisfunktionen* leisten der Restitution den grössten Widerstand. Bei den Teilrestitutionsfällen sind die