

AVIATION MEDICINE TRANSLATIONS:

Annotated Bibliography of Recently
Translated Material. IV.

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FOREWORD

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AVIATION MEDICINE TRANSLATIONS:

Annotated Bibliography of Recently Translated Material. IV.

Achiary, A., Cabanon, A., Andre, V., and Richet, J. *Décompressions rapides et explosives en vol Etude de 15 observations.* (Rapid and explosive decompression in flight; a study of fifteen observations.) *La Medicine Aeronautic*, 11: 73-86, 1956.

In the cases considered, explosive decompression was well tolerated.

The strong effects of cold could be counteracted by improved equipment for the pilot's protection.

Pneumatic shock is benign, posing the problem of the final altitude only.

Cabin altitude after decompression at high mach numbers can be, it was observed, much higher than at ground level. The authors believe therefore, that fighter aircraft operating around 43,000 feet should be equipped with automatic oxygen-overpressure regulators. (Translated conclusion.)

Bárány, R. *Weitere Untersuchungen über dem Vestibularapparat des Ohres reflektorisch ausgelösten rhythmischen Nystagmus und seine Begleiterscheinungen.* (Further studies of rhythmic nystagmus set off as a reflex by the vestibular apparatus of the ear and of its accompanying phenomena.) *Monatsschrift für Orhenheilkunde und Laryngo-Rhinologie*, 41: 477-526, 1907.

Thirty-two points are summarized: 1) Up to the 50th year in normal individuals, greater age has no influence on the duration of horizontal postnystagmus after 10-time rotation. 2) The average duration of horizontal postnystagmus in normal individuals amounts to 40 seconds. There are great physiological differences, with the minimum being almost 0 and the maximum 1-1/2 minutes. 3) In dancers who dance only toward the right, the duration of postnystagmus after 10-time rotation to the right is

significantly less than the after 10-time rotation to the left (30 seconds: 49 seconds). (Habituation? Predisposition?) Between dancers who dance to both right and left and nondancers there is no significant difference. 4) Neurasthenia appears to increase the duration of horizontal postnystagmus (61 seconds). 5) Patients who suffer from vertigo without neurosis show a reduction of the duration of horizontal postnystagmus compared to the norm (34 seconds). (Diminution of sensitivity through adaptation of the centers?) 6) Patients with vertigo and neurosis show no difference in duration of horizontal postnystagmus compared to the norm, nor do patients who have suffered cranial trauma. (Adaptation of the centers inhibited by the neurosis?) 7) Rotary postnystagmus after 10-time rotation with 90° forward inclination of the head shows on the average no significant difference in duration between normal individuals and diseased ones (20 to 25 seconds). The physiological differences in normal individuals run from almost 0 to 40 seconds. 8) In cases with an "above-average" duration of horizontal postnystagmus, the duration of right and left nystagmus is equally great in only one-sixth of the cases, in contrast to "below-average" cases, in which more than one-half show agreeing figures for right and left nystagmus. In five-sixths of the above-average cases, there is a considerable difference in the duration of right and left nystagmus, averaging about 20 seconds. Among below-average cases, this difference runs about 10 seconds. For rotary nystagmus, the difference between right and left nystagmus is 8 seconds among above-average cases and 4 seconds among below-average cases. 9) The duration of horizontal and rotary postnystagmus after rotation to the left exceeds that after rotation to the right in both normal and diseased indi-

viduals. 10) In repeated examination with rotations in immediate succession, no fatigue appears. 11) In repeated examination on different days or on the same day, in one-fifth of the above-average cases and in one-half of the below-average cases, no difference is found in the duration of horizontal postnystagmus. The average difference in above-average cases, ignoring those with "central continuation of spin," is 10 seconds, and among below-average case, 4 seconds. 12) The variation in duration takes place in more than one-half the cases so that one side remains greater; in about one-third of the cases, right nystagmus predominates in one examination and left in the other, and, in about one-sixth of the cases, the duration for right and left nystagmus is the same at one examination but one side predominates at another examination. 13) In normal above-average individuals, the duration of horizontal nystagmus is always considerably greater than the duration of rotary nystagmus. In normal below-average individuals, the duration of horizontal and rotary nystagmus is often equal. 14) In above-average cases with vertigo, the duration of rotary nystagmus is rarely equal to that of horizontal nystagmus. This is a pathological condition. In below-average cases with vertigo, the duration of rotary nystagmus is rarely greater than that of horizontal nystagmus; this is also to be regarded as pathological. 15) In cases that suffer from vertigo, the influence of the side affected on the duration of horizontal or rotary postnystagmus cannot be detected. 16) The duration of horizontal nystagmus without the use of the opaque spectacles is a fraction of its duration behind the opaque spectacles (one-half to one-third). 17) Faster rotation either extends the duration of horizontal postnystagmus or effects an increase in amplitude of the movements and an increase in their number. 18) When the duration of horizontal postnystagmus is determined after 3-, 5-, 10-, 20-, 30-, 40-, 50-, and 60-time rotations, it is found that postnystagmus after 10-time rotation constitutes the maximum. The length of duration falls off on each side. In nearly all cases, 3- and 5-time rotations give a slighter duration than 10-time rotation. In cases where the duration after 10-time rotation is above the average, 20-time rotation usually gives lower figures than 10-time rotation;

where the duration after 10-time rotation is below the average, the duration after 20-time rotation is equal to or greater than that after 10-time rotation. The same relationship that exists between 10- and 20-time rotation also exists between 10-time and 30-, 40-, 50-, and 60-time rotations. In above-average cases, it sometimes happens that 3-time rotation gives a longer duration of postnystagmus than 20-time rotation, but the nystagmus after 20-time rotation is always more rapid and more powerful. 19) After 20-time and longer rotation, especially in above-average cases, after the end of postnystagmus, a so-called "post-postnystagmus" sets in, in the original direction of rotation; it can only be centrally conditioned. 20) After $\frac{1}{2}$ and 1 revolution, many persons show traces of postnystagmus if the opaque spectacles are used in the examination. 21) The number of twitches in the unit of time is greatest immediately after halting of rotation and least toward the end of the postnystagmus. Postnystagmus after 3- and 5-time rotation takes place slower than after 10-time rotation. After 10-time rotation there is an average of one twitch per second. After 20-time and 30-, 40-, 50-, and 60-time rotations, the nystagmus is usually more rapid than after 10-time rotation. 22) The number of twitches may vary in repeated examinations. The subject can also change it voluntarily. 23) In the study of horizontal nystagmus during rotation on the turntable, it is advantageous to use the opaque spectacles to exclude optical nystagmus. 24) No diagnostic value is to be attributed to the presence or absence of the sensation of counter-rotation upon stopping after rotation. 25) Examinations of persons who have no labyrinth on one side always give a greater duration of postnystagmus toward the normal side than toward the defective side; 28 seconds: 14 seconds for horizontal, 18 seconds: 9 seconds for rotary nystagmus. The twitching movements also take place more rapidly and are of greater amplitude. 26) By itself the study of rotational nystagmus does not suffice to establish a diagnosis of unilateral destruction of the vestibular apparatus, but it constitutes a valuable complement of the examination in cases where the caloric reaction gives a doubtful result. 27) In many patients with vertigo without destruction of the vestibular apparatus, an attack of rotary

nystagmus with vertigo occurs in connection with quick movements of the head. When the head is tilted back, this rotary nystagmus is always in the direction of the diseased side. When the head is tilted toward the shoulder on the diseased side, rotary nystagmus occurs toward the diseased side, and, when the head is tilted toward the shoulder on the healthy side, rotary nystagmus more rarely occurs toward the healthy side. These attacks are not found with every movement of the head of the kind described, but only occasionally. 28) In cases where no attack can be induced during the examination, nystagmus generated by rotation and an identification of the spontaneous vertigo with the vertigo after rotation at 90° with the head held forward is obtained from the patient. 29) Nystagmus attacks even occur in normal persons, especially smokers, but they are quite slight and without disagreeable subjective accompanying symptoms. In neurasthenics and accident victims, they play a big role, especially as a consequence of the unpleasant subjective symptoms accompanying the vertigo; in these cases they often cause unfitness of the affected person for work. 30) The symptoms accompanying vertigo in normal persons are seldom very unpleasant. Rotation with head upright is almost always tolerated readily. After rotation with head held forward slight nausea often occurs. Among neurotics the symptoms accompanying vertigo are usually very unpleasant. Severe nausea to the point of vomiting, paling, outbreak of sweat, anxiety, trembling, palpitation of the heart, and loss of consciousness are not rare, especially in connection with rotary nystagmus. 31) Neither the Breuer-Mach theory nor Ruppert's hypothesis suffices to explain all the phenomena observed here. It seems indicated not to modify the Breuer-Mach theory but to replace it by a new theory. 32) The author's theory, in partial conformity with Dr. Abel's, consists in the main of assuming that the movement of the endolymph in the ampulla is the process that sets off the stimulus. This momentary stimulus releases central tonic forces and thus effects the continuance of nystagmus (and of the sensation). For complete development of the theory, some experimental data are still needed. (Translated summary.)

Feldmann, H. *Die Bedeutung des binauralen Hörens für die sprachliche Verständigung unter Lärmwirkung.* (The significance of binaural hearing for language communication under influence of noise.) *Acta Oto-Laryng.*, 59: 133-138, 1965.

Psychoacoustic experiments by the author have shown that the effective signal-to-noise ratio is considerably raised by binaural hearing if certain parameters (intensity, time-delay) of both components differ in both ears. The effect of these factors is examined (influence of frequency, coherence, etc.), and the results are discussed in view of the central nervous mechanisms evaluating binaural information. (English summary.)

Fink, Z., and Trileta, V. *Vliv Nekterych Anticholinergik Na Mozkovy Acetylcholin Krys.* (Influence of certain anticholinergic compounds on cerebral acetylcholine in rats.) *Casepis lekaru ceskych*, 102: 305-309, 1963.

Effects of Benectyzin, Atropin, 2-PAM, TMB-4, and DFP were studied. (Note: Existing laws relating to copyright require that the text of this translation be restricted to the official use of the U.S. Government.)

Güttich, H. *Über das Zusammenspiel der Endorgane des Vestibularapparates.* (The interplay of the terminal organs of the vestibular apparatus.) *HNO; Beihefte zur Zeitschrift für Hals-, Nasen- und Ohrenheilkunde*, 11: 126-128, 1963.

Each auricular labyrinth works with special reference to its own side and its own functions, and the otolith apparatus can, if it comes into action, suppress the semicircular canal stimulus. (Translated summary.)

Ikegami, H., and Takase, I. Effect of oxygen breathing on the following hypoxia. (in Japanese) *Japanese Journal of Aerospace Medicine and Psychology*, 2, No. 2: 57-63, 1965.

Oxygen inhalation prolongs time of useful consciousness (TUC) in the following nitrogen inhalation. The relation between duration of previous pure-oxygen inhalation and prolongation of TUC (which means, in this experiment, the period of time from onset of nitrogen inhalation to appearance of a high-voltage slow

wave in the EEG) was studied using 10 rabbits immobilized by curare and artificially respirated. The following results were obtained:

1) The TUC in the hypoxia, which ranged normally from 36 to 51 seconds, average 43 seconds, was prolonged by previous oxygen inhalation. This effect of oxygen was saturated in 1 minute of inhalation, and TUC was fixed at around 71 seconds in the hypoxia with longer prebreathing.

2) The period of time in which the pulse rate decreased to two-thirds of its initial value was prolonged and saturated by prebreathing of oxygen in the same way as TUC.

3) These effects of oxygen breathing may be based on the increased oxygen mainly in the lung and slightly in blood or tissue.

4) The effects of oxygen prebreathing on EEG and pulse rate in the following hypoxia were eliminated quickly by interruption of the prebreathing. Effects were eliminated more quickly on EEG than on pulse rate. (English summary.)

Iwaki, S. Studies on the influence of ethanol upon the labyrinth function, especially on automobile driving under conditions of drunkenness. (in Japanese) *Acta Medica*, 31: 1022-1035, 1961.

The influence of alcohol upon vehicle-driving skills that depend heavily upon labyrinth and equilibrium functions was investigated in 51 subjects using seven tests: model-vehicle driving (miniature driving), visual reaction time, vehicle-driving skill, slow bicycle riding, psychological aptitude, speed judgment by vision, and flicker measurement. The summarized results follow:

1) Regarding the model-vehicle driving test, an increase in getting off the course was observed even in a mild state of drunkenness. Visual reaction time was also considerably slowed.

2) Regarding the vehicle-driving skill test, the increase of mistakes in a mild state of drunkenness was considerable, and driving skill was reduced accordingly. The rate of increase of mistakes versus BAC of 1.053% to 1.095% was 154% to 212%.

3) Regarding the slow bicycle-riding test, the increase of mistakes was considerable even in a mild state of drunkenness, and the frequency of mistakes decreased as the BAC de-

creased as a function of time. The slow bicycle-riding time was reduced during drunkenness and gradually approached the preintake level as the BAC decreased. These effects were more pronounced as the degree of drunkenness progressed from the weak state to the mild state.

4) Regarding the psychological-aptitude test, performance deteriorated in a mild state of drunkenness, and improved to the preintake level as the BAC decreased.

Deterioration of performance in the mild state of drunkenness was clearly observed in the speed-judgment test and the flicker values.

In summary, it appears that automobile-driving skill is reduced by one-half even under a mild state of drunkenness of 1.0% to 1.5% BAC with 1.5 gm/kg alcohol consumption. (Translated conclusions.)

Jobst, K., and Sandritter, W. *Über den Quantitativen Histochemischen Nachweis von Basischen Kernproteinen mit Gallocyaninchromalaun.* The quantitative histochemical estimation of basic nuclear proteins with gallocyanine chrome alum.) *Histochemie*, 4: 277-285, 1964.

A technique is developed for bringing out basic proteins of the cell nuclei with basic dyes after attachment of metaphosphoric acid. The results are compared with fast-green staining pH 8.2 and with biochemical data. The metaphosphoric acid-gallocyanine chrome alum staining gives values similar to those obtained with fast-green staining on bull spermatozoa, thymus lymphocytes, and chicken erythrocytes (trout erythrocytes being an exception.) After deamination (detection of arginine), the cytophotometric results of both stainings agree well with the biochemical values. With succedaneous staining with gallocyanine chrome alum (or toluidine blue or fluorescent dyes) and subsequent metaphosphoric acid-gallocyanine chrome alum staining, an increased dyestuff binding is observed, which is due to a nonspecific staining (attachment to DNA.) (Translated summary.)

Kameda, N., Shimoeda, N., and Saito, T. In-flight loss of consciousness during instrument flying. (in Japanese) *Japanese Journal of Aerospace Medicine and Psychology*, 2: 10-15, 1964.

A student pilot of a T-1A jet trainer, aged 29, fell into unconsciousness during instrument flying (cabin altitude 16,000 feet) and was

admitted to Gifu hospital on April 14, 1962. Inspection of the aircraft revealed that a tube of the oxygen mask was disconnected from oxygen regulator. It seems that this unconsciousness was caused not only by acute hypoxia, but the cumulation of several effects, such as fatigue with shortage of sleep and the psychomotoric task-requirement during instrument flying. Immediately after the patient was admitted, a slight leucocytosis (polynucleosis and relative lymphopenia, -eosinophilia) and hypotension of blood pressure was found. The EEG revealed polyrhythmic irregular low-voltage-type waves, poor σ -waves, and prevailed δ -waves. (English summary.)

Lavernhe, J. *Rythme de vie et changements rapides de fuseaux horaires au cours des voyages aérines.* (How our vital pacemakers are upset by rapid shifts in time-zones during air travel.) *La Presse Medicale*, 72, No. 44: 2623-2626, 1964.

The importance of the nycthemeral life rhythms has been proved both by animal experiments and by the subjective disturbances reported by human beings who must break the rhythms. In the days of sailing ships, the psychological effects of a change in time zone were perhaps negligible. Since then, however, the extraordinary increase in the speed with which those zones can be crossed in fast jets makes the problem an increasingly urgent one. Today, at 60° north latitude, on a line running from Oslo to the southern coast of Alaska, a west-bound jet cruising at 850 km/hr is "turning" at the same speed as the earth: for people aboard, the sun stays in the very same place the whole time. Within a few years, supersonic jets will have expanded the anomaly even further. The Concorde, flying at mach 2, or 2,500 km/hr will make it from Paris to New York in a matter of about 3 hours (allowing time for landing procedures, acceleration, and deceleration). That means two time zones crossed in a single hour.

For flight personnel, these speeds will provide a neat solution to the time-jump problem: with speeds like these, a round-trip transatlantic flight will be a matter of a single day's work, with no problems in staying on home time, and no night flights. But if mach 2 or mach 3 jets are put on the far-eastern flights, for example,

where the flight hours are long and stops frequent, the fatigue/kilometer ratio for flight personnel will be lessened, although the problem of time jumps will still be there, since stopovers will still be necessary for profitable operation of the lines.

Usually, the passenger has only rare occasion to cross any great number of time zones. His troubles are easier to solve. But it is still a good idea, if you have delicate business to transact at your destination, matters requiring full possession of all your faculties, to give some thought to the question of time-jumps. Always allow yourself enough recovery-time after arrival before you start talking business. (Translated conclusion.)

Lehwess-Litzmann. *Das Tragen von Augenhäutchen bei ausgebildeten Fliegern.* (Wearing of contact lenses by airplane pilots.) *Das Deutsche Gesundheitswesen*, 19: 1781-1786, 1964.

The author reports on the wearing of contact lenses by fully trained aviators with decreasing visual power, as well as their tolerance in the vacuum chamber and at practical flights. The plastic lenses hitherto applied are compared with the new gel lenses of polyglycolmonometa-cryl. The Gel-shells adhere much better and are much better tolerated. The new porous substance of the lenses prevents the formation of gas bubbles under the shell in high altitudes. Although up to now contact lenses have been worn only by very few aviators suffering from light refractive disturbances, the use of contact lenses could greatly increase in the future. As minus lenses were hardly available among the new Gel-shells at the time of testing, nothing can be stated so far on their optical quality. Further tests will be made. In the author's opinion, such contact lenses may be applied under the following conditions: The tolerance period must be 7 to 8 hours. The shells must be designed in such a way as to be put in easily and safely. There must not occur any troubles and impairment of the visual faculty under conditions of altitudinal stress in the vacuum chamber.

For the time being, applicants who wear contact lenses should not be admitted for an aviator's training. For all applicants, the following principle should be maintained: full visual

power of both eyes is required at the beginning of the motor-flight training. (English summary.)

Masuyama, E. Human engineering research of tracking behavior I. (in Japanese) *Japanese Journal of Aerospace Medicine and Psychology*, 2, No. 2: 64-77, 1965.

Subjects tracked rectangular waves and obtained the following results. The numbers indicate the experiment numbers. Only in Experiment 5 were the subjects' feet used for compensatory tracking. In the others, pursuit tracking was performed by hand.

1. When the on-off time intervals of the rectangular wave were relatively short, those for the on (DT_1) were shorter than those for the off (DT_2). On the other hand, when the on-off time intervals were relatively short, DT_2 was shorter than DT_1 .

2. When the subject was made to track rectangular waves with five amplitudes with relatively short on-off intervals of 0.5 to 1.6 seconds, a central tendency for amplitudes appeared.

3. When the subject was made to track on the basis of the two instructions, "accurately" and "quickly," the results for DT, TT, and D in each case were better under the instruction "quickly," and the results were excellent only for the "rate of false reaction" under the instruction "accurately."

4. In the correlograms of DT, TC, and D, there was a fluctuation for each time for each one of these (the control with respect to "on" and the control with respect to "off" were independent), and in addition, in a correlogram of dead time, periodicity of 1 in 18 times appeared (what might be called the periodicity of attention).

5. When the subject was made to perform compensatory tracking of rectangular waves by foot, those who apparently were skillful had smaller average DT_1 values and smaller distribution than those who apparently were not skillful.

6. There is a compensatory effect between the reaction time DT_1 with respect to the "on" rectangular wave and the DT_2 with respect to off. The DT_1 with respect to "on" and the TC_1 are independent. There is a relationship of

dependence between TT_1 and TC_1 with respect to "on". (Translated summary.)

Meineri, G. *Gli effetti della subgravità e i metodi per riprodurla a terra e in volo.* (The effects of weightlessness and methods of reproducing it on land and in the air.) *Annali di Geofisica*, 3: 429-446, 1963.

The author briefly enunciates the problem of subgravity, together with an account of the more creditable experimental solutions devised in the last 10 years with respect to the problems posed to scientists, biologists, and expert engineers by this peculiar and exclusive feature of space flight.

The author then describes the chief methods and physical means used to simulate subgravity conditions. A distinction is made, in the first place, between "ground" methods (recommended for easy performance and greater security; however, they usually permit investigation of only a few of the psychophysiological aspects occurring in space flight) and the much more cumbersome methods through which real and complete subgravity conditions can be attained (parabolic flight and suborbital and orbital launching of missiles). Thereafter, he reports on the accomplishments and activities of the Center of Studies and Researches of Aerospace Medicine in Rome by means of the Subgravity Tower designed and installed at the Center's own initiative.

This Tower yields real, though short-lasting, subgravity conditions, preceded and followed by periods of acceleration. Using the Subgravity Tower, it has been possible to study a few problems of space flight, particularly the transition between the active and passive stages of space flight. Solutions of significant practical consequences could be put forward (psychomotor behavior of subjects; the role played by the labyrinth as a whole and by its individual components, etc.).

In conclusion, the author emphasizes the interest of these methods and the possibility of furthering them on a larger scale, within the scope of world researches on space flight. (English summary.)

Mitarai, G., and Takagi, S. Electroretinogram at high altitude in the low pressure chamber, and under gravitational stress. (in Japanese)

indicated no such differences. It was therefore concluded that the vestibular apparatus did not play an indispensably vital role in the subjective judgment of body tilt. The role appeared very indirect and minor; however, it seemed to play a most positive role in posture-righting reflex.

4. *Effects of Luminescent Straight Lines on Subjective Judgment of Body Tilt.* As visual cues, luminescent straight lines were provided that maintained a 90° angle to the floor of the tilting room, a 45° angle, and a position of verticality with reference to the direction of gravitational forces. After the subjects were provided with these luminescent straight lines, they were asked to do similar tasks of evaluation of the angle of body tilt. Of these three lines, the one at a 90° angle to the floor produced subjective evaluations closer to the objective values. In other words, the luminescent straight line at a 90° angle to the floor acted as a more potent and dominant visual cue than the true verticality, probably due to the fact that the line in alignment with the axis of the body disturbs the body and the field of vision less than either the slanted or the vertical line. (Translated summary.)

Noyere, J. B. (Mission Report—National Sonic Boom Structural Response Flight Test Program.) Document 15/64, 21 December, 1964.

The FAA conducted a very difficult and expensive operation here that came off very well. There are a few points, however, that are rather regrettable, such as the fact that the structures were put up too quickly and that these structures were too “young” at the beginning of the investigation. Another point is the absence of NASA, which could have made pressure measurements and which could perhaps have profited from the large number of flights made here in order to conduct other measurements. A third point involves the fact that no pressure registration was immediately analyzed. The use of a cathode oscilloscope and a Polaroid camera, for example, would have easily made this possible. In general, the small role played by measurements in the overall cost of the operation is surprising.

It does not seem that all of the original objectives of the operation were achieved. The window-breakage threshold was determined,

but the behavior of the structures could perhaps have been derived from acceleration and speed measurements. After the end of the experiment, however, the men in charge thought that it would not be possible either to determine why structures respond the way they do or to extrapolate the results obtained with respect to other structures.

As for the visual observations, the first analyses that were made did not make it possible to determine what damage was due to the sonic boom and what damage was natural.

It is a little too early to arrive at any final conclusions but, from the European viewpoint, the range of structure samples was not representative of what we would find in European countries, particularly in France, and the results are therefore not directly transferable.

It is very likely that the second phase of this investigation, during January and February, will be more profitable. By then, the structures will have had a chance to settle, the test teams will have had a chance to benefit from the experience acquired during the first phase, and finally, NASA will perhaps participate in the measurements. (Translated conclusion.)

Oshima, M., Fujie, Z., Uyeda, Kondo, T., Kitsumoto, K., et al. Physiological and psychological stresses in operating aircraft and surface vehicles—Symposium. (in Japanese) *Japanese Journal of Aerospace Medicine and Psychology*, 2, No. 2: 103–107, 1965.

Today's presentations on the subject of stress have shown that the stress on an operator differs with different vehicles, operating conditions, and environment.

Generally speaking, however, it seems that there is some level of tension in man, which differs for different persons, to which stresses due to work are added. These latter stresses vary with the work. The total stress then manifests itself in some way. Whether this process is correct or not seems to be a problem that should be studied in the future.

In most of the work presented, the results were based on some unit peculiar to the individual occupations. It would be worthwhile to study the question of the *total* stress on a person during the course of a day or the effects of long-term stresses. These are again problems for the future. (Translated conclusion.)

Pialoux, P. *La Physiopathologie de l'Equilibre chez l'Aviateur.* (Physiopathology of aviator's equilibrium.) *Revue de Médecine Aéronautique*, 3: 72-77, 1964.

An analysis of equilibrium problems in pilots is presented. The author offers an anatomical and physiological review of the vestibular system, vision, and "deep sensibility"; i.e., the system of striated musculature and the proprioceptive system. The sense of equilibrium is examined in terms of disorienting stimulation encountered in flight, and various illusions are discussed. Corrective measures are presented. Conclusions concerning the effects of weightlessness upon the vestibular apparatus are included, and results of several aeromedical studies of equilibrium are reported.

Rossi, G. *L'innervation efférente des récepteurs vestibulaires.* (Efferent innervation of the vestibular receptors.) *Acta Oto-Laryng.*, 58: 230-238, 1964.

Current literature and personal experimental findings on the efferent innervation of the vestibular receptors are discussed. (English summary.)

Rozenfel'd, Ye. L., and Popova, I. A. *Izmenenie aktivnosti α -1 γ -amilaz pecheni pri vvedenii krolikam adrenalina.* (Effect of adrenaline on α - and γ -amylases of the rabbit liver.) *Voprosy Meditsinskoy Khimii*, 8: 468-471, 1962.

1. The injection of adrenaline in rabbits produces increased γ -amylase activity and reduced α -amylase activity in the liver.

2. Differences in the degree of decomposition of glycogen and amylopectin by γ -amylase obtained from control and test rabbits are particularly great during the first hours of incubation and then even off gradually. (Translated conclusion.)

Saito, I., Fujiwara, H., and Iwane, M. The effects of G force on body temperature. (in Japanese) *Japanese Journal of Aerospace Medicine and Psychology*, 2, No. 2: 78-83, 1965.

The influence of G forces on rectal temperature was studied in rats. The rats, fixed in the appropriate cage, were subjected to +5, +10, and +15 G, -5 and transverse 5, 10, and 15 G. The rectal temperature was measured with a thermistor 3 minutes after the stress and then

every 3 minutes until it recovered near control level.

The rectal temperature decreased 3.2°, 3.7°, and 5.4° C, suggesting that the magnitude of the decrease of the temperature is the function of the stress. In the case of transverse G, however, this relation is not clear, as the temperature decrease is 2.9°, 4.1°, and 3.1° C at 5, 10, and 15 G, respectively. There were no rats that could tolerate the -10 and -15 G, and, at -5 G, temperature decreased 3.1° C.

The recovery of the temperature took place immediately after, and the more severe the stress, the less recovery is revealed. The characteristic finding in recovery is the lack of the tremor that used to appear in the recovery from the low-temperature stress. The possible mechanism for the disappearance of tremor was discussed. (English summary.)

Saito, I., Iwane, M., and Ishizaki, M. The biological effects of the Coriolis acceleration. (in Japanese) *Japanese Journal of Aerospace Medicine and Psychology*, 1: 11-15, 1963.

Twelve healthy subjects were examined in reference to electrocardiogram, nystagmic eye movement, galvanic skin reflexes (GSR), plethysmograph of the finger, and blood pressure under Coriolis acceleration. The Coriolis was given by inclining their heads right and left while under a constant force of 1.4 G. Pulse rate reacted with transient tachycardia in most of the cases, but, in a few, transient bradycardia took place instead of tachycardia. The maximal blood pressure was raised moderately in 11 cases. GSR appeared to correspond with the susceptibility to motion sickness. Nystagmus was noticed in only one case, contrary to expectations. All subjects experienced the positional illusion to some extent. Three cases had nausea. These subjective symptoms did not seem to be parallel to the motion-sickness constitution of each individual. (English summary.)

Sandritter, W., Kiefer, G., and Rick, W. *Über die Stöchiometrie von Gallocyaninchromalaun mit Desoxyribonukleinsäure.* On the stoichiometry of gallocyanin chrome alum with desoxyribonucleic acid.) *Histochemie*, 3: 315-340, 1963.

In this study, the extent to which GC is combined stoichiometrically with DNA in the cell

nuclei and therefore the extent to which it is useful in a quantitative cytophotometric determination was investigated.

The dye was tested for purity by paper chromatography and electrophoresis, and the changes in the optical properties were investigated after chrome-complex binding and after the binding to nucleic acids.

Optimum conditions for the production of the stain solution and for the staining process could be determined through a series of tests (testing the influence of the boiling time, age of staining solution, dye-stuff concentration, staining duration, pH of stain solution, fixation, treatment with RNase and differentiation for dyebinding, and light fastness).

The relatively good specificity for the strong acid phosphate group (sulfate groups were stained red ("pseudometachromasia") and the validity of the Lambert-Beer-Bouguer Law in tissue and solution enable a microphotometric determination of nucleic acid after staining with GC to be made.

Cytophotometric measurements on RNase-treated cell nuclei that had been stained with GC showed that, in the case of mammals, the GC quantity is parallel to the DNA quantity, respectively, the ploidy stages. Deviations can be found in spermatozoa and in the nucleus-containing erythrocytes of low vertebrates. This is probably connected with the strong basic protein component in these cell nuclei.

Results show that GC staining offers a few advantages over Feulgen staining, such as, for instance, simplicity of method used and good reproducibility. The disadvantages of GC staining primarily involve the lower specificity for DNA and the effect of pretreatment of the tissue so that it is possible to compare only preparations that have been treated in exactly the same way.

A calculation of the GC quantity left in a diploid cell nucleus after RNase treatment leads to the conclusion that every phosphate group of nucleic acid is charged with only one dye molecule.

From the behavior of the dye in the produc-

tion of the staining solution and in the staining itself come the ideas that the trivalent chrome is bound to GC in a complex fashion and that the practically insoluble chrome double complex with GC and nucleic acid develops during staining. On the basis of the investigations, the optimum conditions for staining with GC were given. (Translated summary.)

Siroky, A., and Krejcova, H. *Rozbor Elektrownystagmogramu Zdravych Osob.* (Analysis of electronystagmogram of healthy persons.) *Ceskoslovenska Fysiologie*, 13: 337-342, 1964.

An analysis of 25 electronystagmograms of healthy persons has shown that the characteristic parameters for an evaluation of the functioning of the vestibular organ are the duration of the first phase of the postrotation nystagmus, its amplitude, and its frequency.

The authors have found that among these parameters the least-reliable parameter is the duration of the first phase of the postrotation nystagmus. An evaluation of the functioning of the vestibular organ by one parameter alone does not have much of a clinical value. An accurate picture of the functional condition of the cupuloendolymphatic system is provided only by a mutual correlation of all these parameters (duration, amplitude, and frequency of the first phase of the postrotation nystagmus).

It seems that the latency that occurs at the start of a postnystagmus is physiological and is caused primarily by an interval coming from the oculovestibular reflex arch. (Translated summary.)

Tada, H. Overestimation of farther distance in depth perception. (in Japanese) *Japanese Journal of Psychology*, 27: 204-208, 1956.

Experiments were conducted in bisection of depth distance to establish whether or not overestimation of farther distance in space occurs at a relatively short distance. The applicability of a quantitative formula for measuring depth vision concerning very far distances was tested.