URGENT ADAPTATION IN LIGHT OF CORRELATION ADAPTOMETRY

T. P. Mansurova, Ye. V. Smirnova, G. F. Bulygin

Krasnoyarsk AMSE Center[1]

Institute of Biophysics, Russian Academy of Sciences,
Institute of Medical Problems of the North
Russian Academy of Medical Sciences

Introduction

The main task of modern medicine is preservation of the health of a man. This problem seems to be the most pressing in exploring of northern territories of this country, when natural and climatic factors influencing the organism are quite different from the previous ones. When arriving at the new natural and climatic zone the organism of a man starts adapting to the new living conditions. And here appears the new problem. Weather a man will be able to exist in the new conditions and weather the adaptation will be successful. The problems could be solved but only in a case we know a man's reaction upon certain group of natural and climatic factors.

One of the topics of the researches in influencing of factors of different nature and intensity is "physiology of man's migrations" [2]. Migration of a man with the existing level of transport means can be considered as the element of planned loading of functional systems of the organism. Finding out laws under influence of which functional systems of the organism move to the condition of adaptation to this influence of irritants can help to solve the problem of preserving health when:

1. There is the migration of the population.
2. Watch system of work.
3. Arm service.

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[1]Address for correspondence:

Krasnoyarsk AMSE Center
Computing Center, Russian Academy of Sciences,
Krasnoyarsk-36660036, Russia

There are two different types of adaptation - urgent and long-term. Urgent adaptation of biological system finds its place thanks to the existing resources. Realization of urgent adaptation and transition to long-term one leads the organism to the adapt condition. Impossibility of realization of urgent adaptation can lead to the breakdown of adapting reconstructions of the organism and loose of health. Understanding of the mechanisms of realization of urgent adaptation allows to forecast further adapting reconstructions.

In 1989 A. Gorban and Ye. Smirnova suggested method of correlation adaptometry [3].

The goal of this paper was to use the method of correlation adaptometry for finding out law during the period of urgent adaptation.

Methods and Materials of Research

Data for processing were given by the Institute of Medical Problems of the North (Russian Academy of Science). On the research there were practically healthy men, soldiers from Krasnoyarsk and Norilsk. The research was held in winter and summer in Siberia and Sapolyarie. After a few hours of staying soldiers were tested by the group of doctors excluding people who suffered from hepatitis, pneumonia, chronicle diseases of other organs and systems as well as those who were ill with any disease in the last 2-3 months before call to the military service.

Repeated tests were made in a short intervals during the first month of adaptation (5-7, 8-10, 12-15, 17-20, 30 days after arrival) and in 1. 5-2, 3, 6, 12, 18 month.

Analysis of the dynamics of arithmetic means founded out the period of urgent adaptation - 45 days after arrival [2].

With the help of the method of correlation adaptometry there were processed 6 groups of indexes: physiological (PHYS), total blood count (TBC), fraction of neutral lipids (FNL), phospholipids (PHL), fones of ferments (FF) and activity of ferments, hormones (AF&H) (80 indexes).

Dynamics of the weight of correlation graph is on the Fig. 1-4.

Analyses of correlation of indexes at 6 groups shows that:

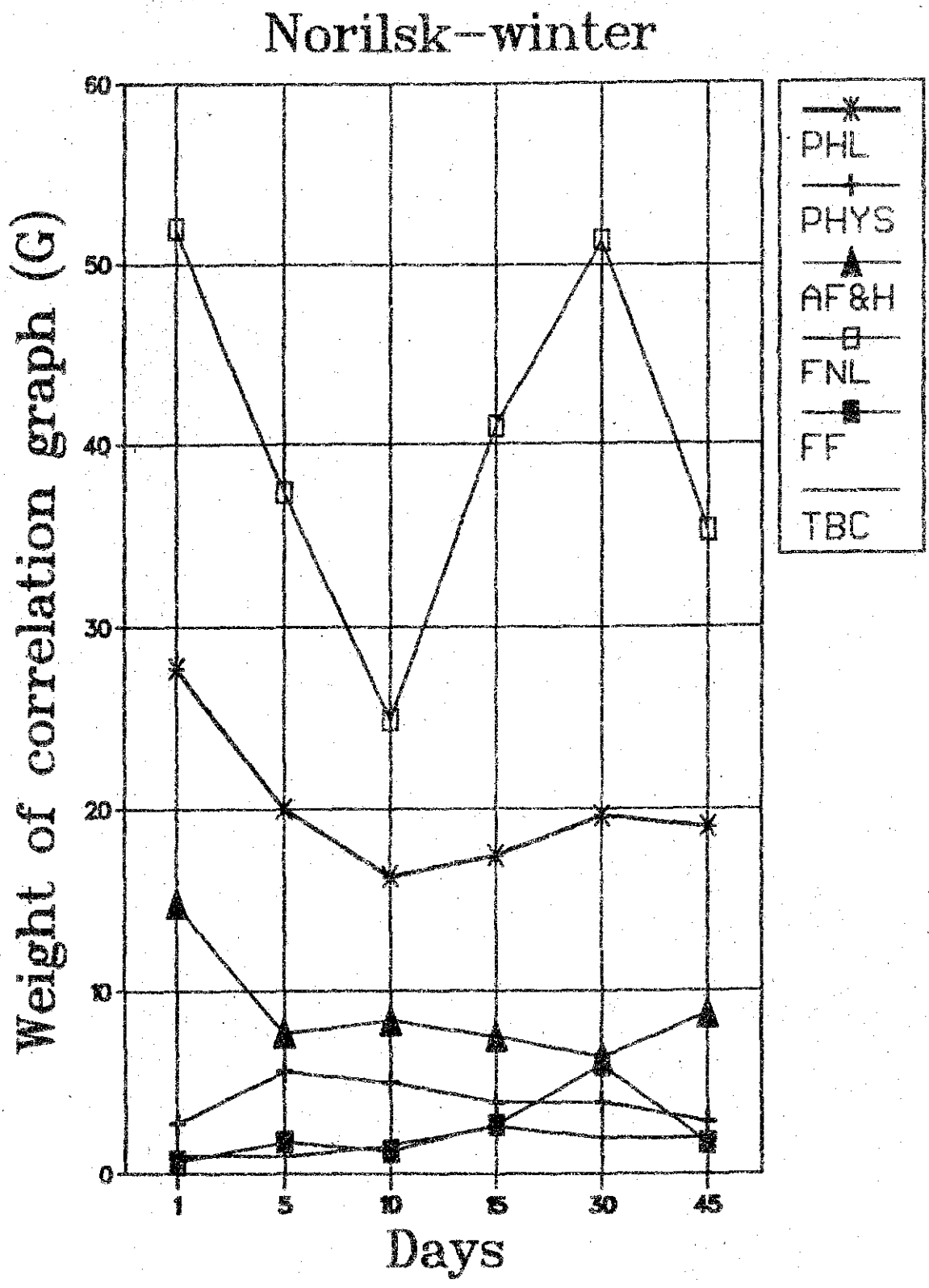

Fig.1 Dynamics of the weight of correlation graph during urgent adaptation

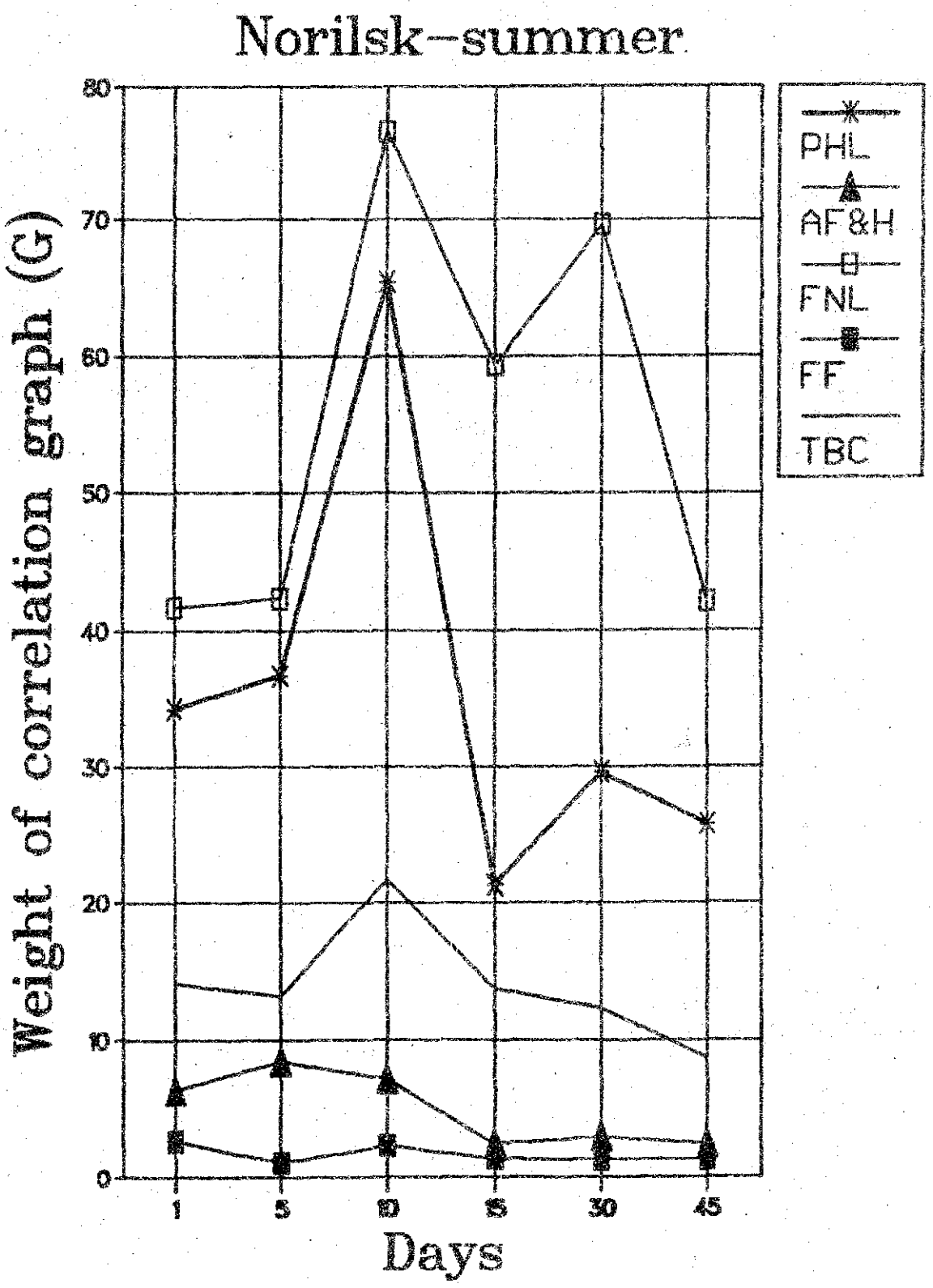

Fig. 2 Dynamics of the weight of correlation graph during urgent adaptation

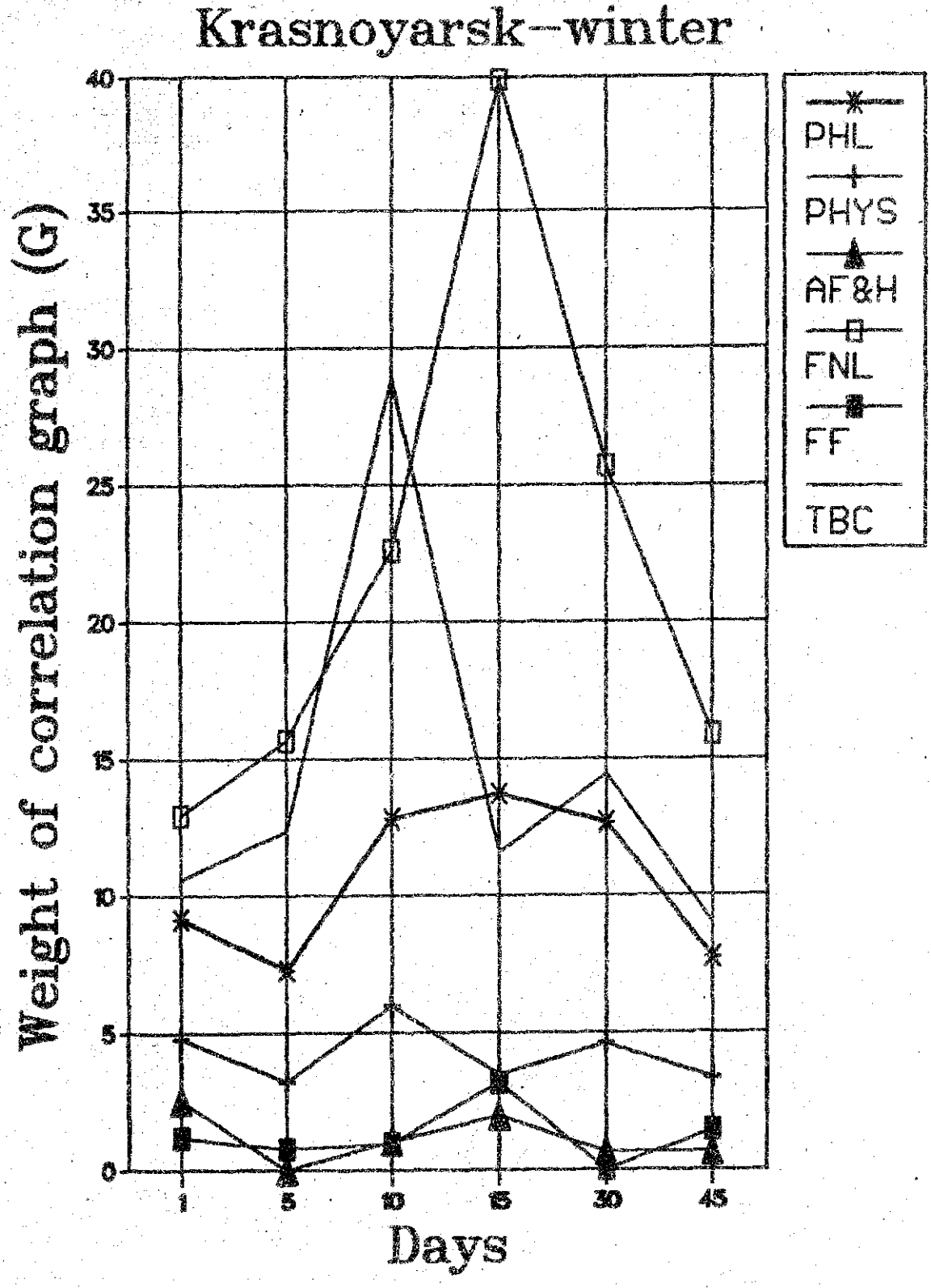

Fig. 3 Dynamics of the weight of correlation graph during urgent adaptation

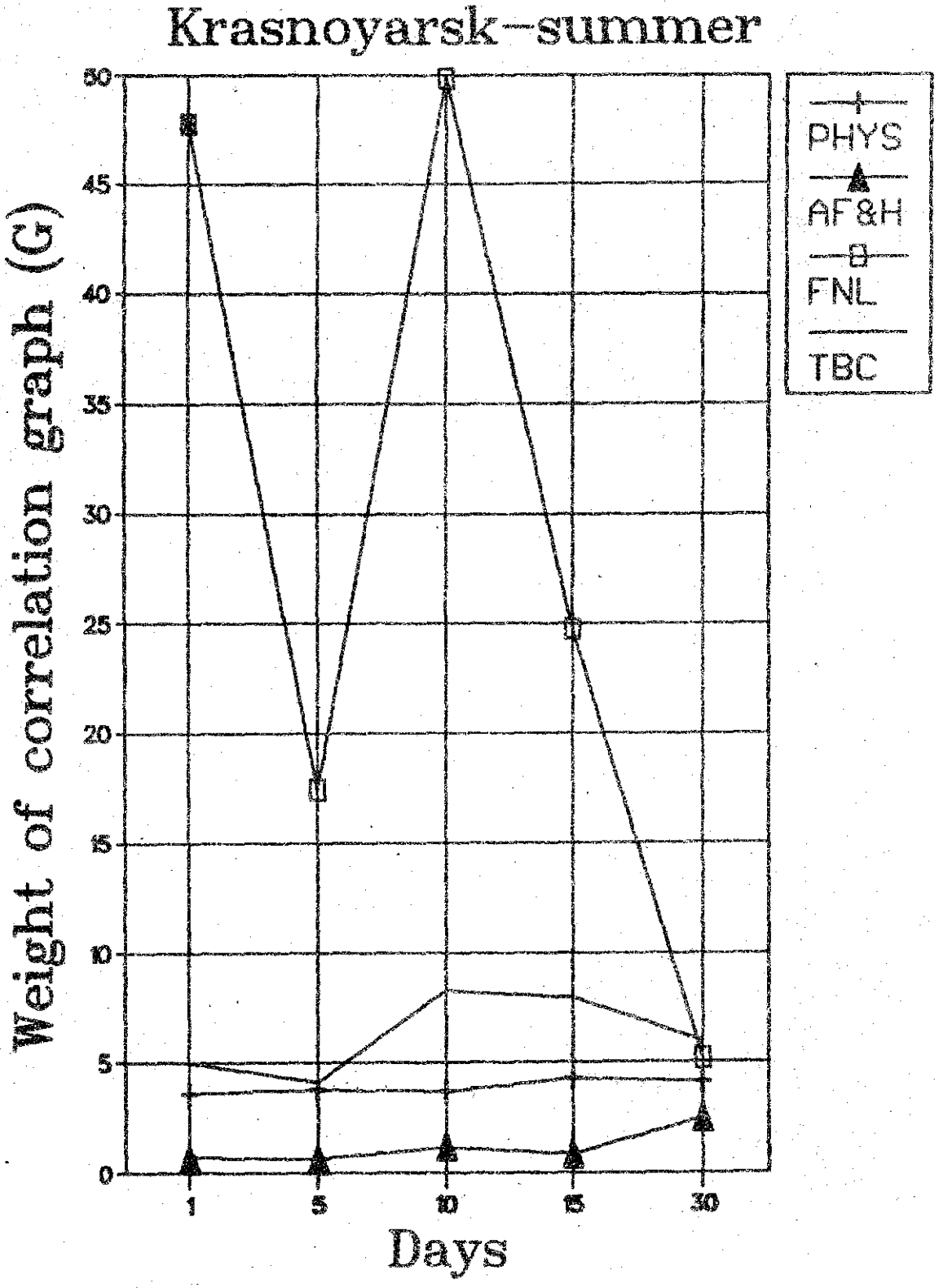

Fig. 4 Dynamics of the weight of correlation graph during urgent adaptation

1. Dynamics of correlation of indexes depends on the set of natural-climatic factors (Norilsk, Krasnoyarsk).
2. There is a certain dependence of dynamics on the season of the year.
3. There are fluctuations in changes of correlations of parameters in all groups of indexes. It proves the fact that there are phases in the process of adaptation.
4. Taking into consideration the fact that under the increasing of adaptational loading the level of correlation also increases. Finding out maximums of indexes correlation in the process of adaptation to new living conditions could be used in outing unfavourable periods for a man's organism (Norilsk-winter: 1-st and 30-th days of adaptation; maximums coincide in 3 groups of indexes out of 6; Norilsk-summer: 10-th day - maximums in 4 groups out of 6 with the full identity of dynamics; Krasnoyarsk-winter - 10-th and 15-th days - 3 groups; Krasnoyarsk-summer: 10 -th day - 2 groups of indexes, in remaining groups changes in the weight of correlation graph are insignificant).

Out of the group of examines there was outlined a subgroup of those who have upsettings in the process of adaptation (different diseases). On Fig. 5-6 is drawn the difference in dynamics of the weight of correlation graph in the group of common lipids and phospholipids. The division into healthy and ill people is taken into account. It could be easily seen that the weight of correlation graph in the groups of ill people at all control deadlines exceeds 2 times the weight of correlation graph of healthy people. It was impossible to estimate the dynamics of adaptational stress in the groups with unsettings of adaptation (because of the absence of the sufficient data during control deadlines).

Some figures of data matrixes were absent (approximate 2-3% out of the common volume of indexes). In connection with it coefficients of correlation were calculated on existing pairs of variable quantities [4]. Practically all matrixes turned out to be indefinite (uncertain) those data regression and factor analysis is impossible [5]. When filling in gaps there appears approximate element. And applying the method of correlation adaptometry for these kind of data turned out to be effective. The results do not contradict the theory of adaptation.

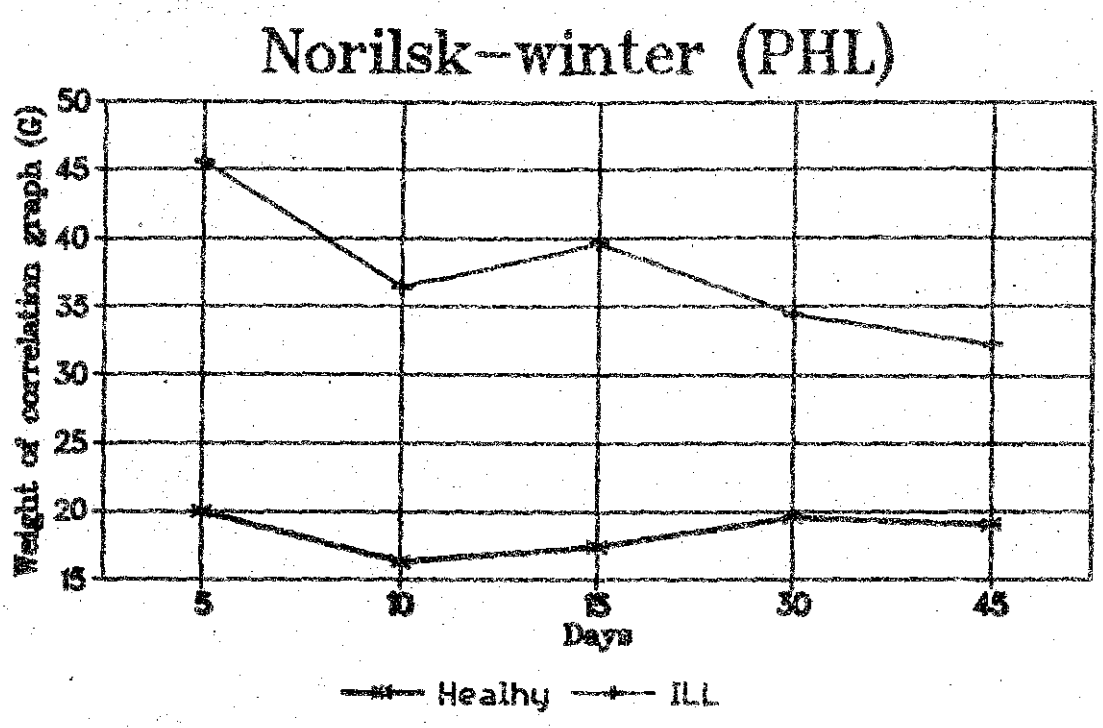

Fig.5 Dynamics of the weight of correlation graph in the subgroups of healthy and having upsetting in the process of adaptation

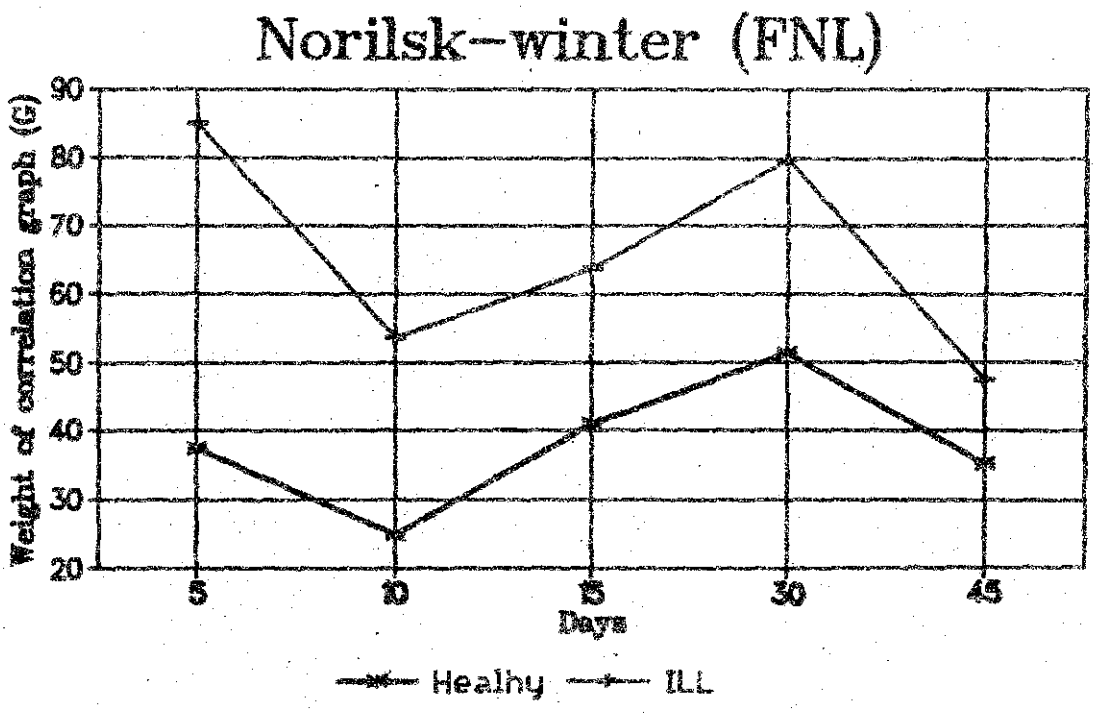

Fig.6 Dynamics of the weight of correlation graph in the subgroups of healthy and having upsetting in the process of adaptation

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