

THE ULTIMATE GUIDE TO HOME AND WORKPLACE ERGONOMICS



Ergonomic Innovations



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1. Introduction

Thank you for downloading our eBook. You have made a great decision in choosing to learn more about ergonomics.

Unfortunately, it is a sad fact of life that most people only become interested in ergonomics **when something goes wrong**. Maybe this is the case for you, maybe not. Perhaps your pursuit of holistic wellbeing has led you here or maybe it was the latest injury you suffered.

Either way, you've found an essential resource that can set you up to live a more comfortable, productive and healthy life.

You might need to make some adjustments in how you interact with your environment, but the rewards are worth it and it really doesn't have to be difficult.

There is insufficient awareness of what ergonomics is and why it is important to your overall wellbeing.

As with anything, you can only improve areas of your life that you first become aware of, then informed about.

Poor posture, for example, is unlikely to present any difficulties in the short to medium term. Over time, however, the stress exerted on your back will eventually catch up with you.

That's why we believe in creating ergonomic environments in the places we spend the most time – at home and in work. Small, simple changes can have a dramatic effect on your health and wellbeing. It's simply a matter of being informed - then making those changes that will benefit you for the rest of your life.

Through this book we will show you how to create an ergonomic environment at home and in work. One thing to bear in mind before we get started - we're all individuals and one environment may be ergonomic for you but not your friend/partner/colleague.

That's the whole point of this – arranging and adapting furniture and equipment so suit your own specific needs – not the other way around.

When trying something new, in order to succeed you need guidance. Through this book we will set you on your way to improving your environment through an awareness of what ergonomics is and how it can benefit your daily life.

By the end we hope you will feel energized to take the ergonomic approach and organize your life, not only to make it easier and much more comfortable, but also to improve your comfort, posture and overall wellbeing.

2. Breaking Down Ergonomics

We've all heard the name. The one that floats around in most workplaces, the word that health experts commonly use and the term you hear in furniture shops.

But what on earth *is* ergonomics?



Some may tell you it has a very vast meaning, others will try to convince you it is a pretty specific term, but the truth is, there isn't a simple definition that can truly explain ergonomics.

To understand what this term means and what it really covers, you must gain a broader perspective. So, let's start from the beginning.

2.1 Ergonomics – A Brief History

As a human race we have been improving the way we live since the beginning of time. Take, for example, those who lived through the Stone Age. They crafted stone tools to help them hunt and build shelter. They adapted those tools to make them more effective – resulting in increased comfort and efficiency.

Okay, so we have come a long way since then. We now have complex machines that do this type of work for us; but it illustrates the point that we are always perfecting and evolving our tools and adapting to our environments to help us live more comfortable and productive lives.

Nowadays, comfort is something that we take for granted. We all feel that we should be comfortable in whatever activity we're doing - and rightly so - but sometimes we don't help ourselves in the choices we make - whether that be in terms of posture or equipment used.

So, if we understand that making ourselves comfortable in whatever activity we carry out is important then it comes to reason that this possesses an entire scientific branch that tackles the entire concept. Quite simply, *ergonomics*.

Ergonomics, or as it's sometimes called, *human factors engineering*, is a discipline with a main purpose of designing comfort. This 'comfort discipline' is actually a practice that designs systems, products or processes to make our lives not only a lot easier, but also healthier.

Derived from the Greek words *ergon* meaning *work*, and *nomoi* which means *natural laws*, in its simplest definition, ergonomics represents **the science of work**.

Entailing the whole science of work, it means that ergonomics is a scientific discipline that is concerned with all elements of a system: the principles, the processes, the interactions between people, as well as the relationship between people and the process.



Ergonomics is dedicated to improving the way we work so that both productivity and our level of comfort is enhanced.

Human factors is concerned with finding methods, processes and inventing products that optimizes our whole performance.

Let's say you want to chop wood. What ergonomics is concerned with during this process is everything around that activity. The place you do it, the hatchet you use, the angle you chop the wood from, the amount of strength you use etc.

What ergonomics can help you with is increasing your productivity, while at the same time lessening the whole process for you. You may think this is difficult, but simple ergonomic tricks and tools can enhance your performance, bring you more successful results and make your life a lot easier.

2.2 The Ergonomics Fields

As we have already established, human factors or ergonomics are not simply concerned with one, but all aspects of work. When we say work, we don't just mean your day job. Work, in so far as ergonomics is concerned, is any activity that you carry out in which you need to perform a task or an activity where you want something to be different to how it currently is.

Chopping carrots can be described as work – it's an activity that you carry out in which you're performing a set of actions that results in the carrot going from its whole form (which isn't the way you want it) to slices (the way you do want it).

Reading a book – is this work? Yes it is. Where are you reading the book, what surface are you sitting on, what are the light conditions? How big is the text? All of these factors influence how you are able to perform that “work” – the act of reading and consuming information.

We know this is not how you traditionally think of work and that's fine. Just understand that when we are to effectively measure how good or bad our ergonomics are we need to consider all of these activities in this way.

Watching television. Work? Yes. How far are you from the television? What surface are you sitting on? Is it comfortable? Is your body supported effectively?

In order to fully grasp this concept and take the most from this book we want you to look at your daily activities in another way – a more holistic way that considers the many factors that are contributing to your overall comfort and productivity.

Consider some of these activities and how you interact with the furniture and equipment in their environments: driving your car, working on a laptop, going to sleep.

For a lot of us this might be fundamentally changing the way we look at work, what we think work is. From an ergonomics perspective it is essential to look at work in this way to fully grasp the concept.

“Work is an activity we perform using equipment or interacting with our environment to change something from its current state to the desired state.”

So as you can see, ergonomics is a discipline that can define the way we live – in a good or bad way.



The Three Major Fields of Ergonomics

2.2.1 Physical Ergonomics

The aim of physical ergonomics is to ensure that the human anatomy is comfortable with the equipment and tools that the person is interacting with.

It is mainly concerned with the physiological, anatomical, biomechanical and of course, anthropometric characteristics, and to say that something is ergonomically designed, it means that it must fit the user's needs.

Physical ergonomics also tackles the postures and movements while performing a task, the handling of materials, as well as the pressure used. Medicinally speaking, physical ergonomics is of great significance, as it promotes health and prevents injuries.

2.2.2 Cognitive Ergonomics

Cognitive ergonomics, as the name suggests, is related to the mental processes that affect the human, or human-system interaction (for instance the interaction between two coworkers, or the interaction between you and your device).

It involves motor response, perception, reasoning and memory, and by supporting these aspects, it advances the whole performance.

2.2.3 Organizational Ergonomics

This ergonomic field is particularly important in the workplace, because it puts an emphasis on improving the socio-technical systems.

With the incorporation of ergonomic work systems and organizational structures, organizational ergonomics will make the work atmosphere efficient, productive and comfortable to work in.

Because it is the field that you probably have the most control over and is the easiest to get started with for immediate effect we will mostly stay focused on physical ergonomics in this book.

3. Home Ergonomics

A home is not a home if it is not accommodating. It should be your safe haven; the warm and relaxing place that you return to at the end of the day. A well-organized, free-from-stress and accommodating place that will provide you with comfort.

And while designing your home to your own liking can certainly have a positive effect on your mood, there is much more to comfort than meets the eye.

Chances are, your house is loaded with hidden stress triggers, whether they are poorly designed knives that make your hand hurt after chopping vegetables, a mattress that makes you wake up even more tired than the night before, or simply an unorganized kitchen where you spend more time looking for utensils than you do actually cooking.

Home ergonomics can help you bring order to your house, relieve you from anxiety and drag ease into your life.

The term home ergonomics may sound like rocket-science to you now, but after reading this chapter you will become convinced that it is actually a pretty simple science, and you will see how a couple of undemanding hacks can transform your home into the stress-free, comfortable environment it should be.

3.1 The Kitchen

Given the choice if most people could select one area of the house to be ergonomic, they would choose the kitchen. Why? Because, it is the place where most of the heavy work is done.

If you want to have a home cooked meal without having to spend hours on your feet, then you could do a lot worse than give your kitchen an ergonomic makeover.

The Counter

If you're like most people you probably try to get used to the standard size of your counter instead of simply changing the size to fit your needs.

The key to improving performance and avoid running back and forth while cooking, is in having two counters. If you only have one, like a lot of households, you might want to consider installing another one.

The first counter should be about 34-38 inches off the ground and that will be your main counter where you will do all the preparation work, like chopping and slicing.

The other counter should be about 44-46 inches tall and it should be used for ready-to-serve foods or something you will need later, like a butter that needs to come to room temperature before you add it to your recipe.

Ergonomic Storage

Ergonomic storage is keeping foods and kitchen items in such a way that they are always to hand. There are two rules that need to be followed:

1. Store items where you use them

This means that items should be stored where they are first used. For instance, the knife you chop your vegetables with should be stored where you chop the food, not in a drawer.

Storing knives in drawers is unproductive, because it requires unnecessary motions:

- 1) Step aside.
- 2) Open the drawer.
- 3) Find the knife.
- 4) Take it out of the drawer.
- 5) Close the drawer.

If you simply keep your knives on your work surface in a knife block you will add to your productivity and it will be much easier for you.

2. Store items in single layers

Storing items in a single layer means that there are no other items behind or beneath the one you need, which will save you a considerable amount of time, and save you from making unnecessary body movements. It is always a better idea to store often used items in drawers rather than a cabinet with doors.

There are some amazing kitchen rugs and mats available that will, besides from muffling the noise and preventing you from slipping on that spilled tomato juice, also ease the strain on your feet.

Known as anti-fatigue mats and traditionally considered useful for those with standing desks, these are creeping more and more into people's kitchens due to the excellent support they offer.

This last one is pretty simple and straightforward - try to use as many ergonomic kitchen utensils as possible. They are perfectly designed to fit your hands the right way and to prevent injury.

3.2 The Bedroom

Did you know that, on average, we spend a little less than a third of our lives in bed? If you have a reputation for being cranky in the morning, before you start that self-examination, take a peek into your bedroom. Your bed may be the main culprit.

The best way to ensure a good night's sleep is to invest in a quality, supportive mattress. Sure, it may be expensive but it is probably one of the best investments to your health that you can make.

Orthopedic mattresses are designed to support every inch of your body so that you will wake up fresh and rejuvenated in the morning.

Besides an orthopedic mattress, what your body craves during sleep, is an ergonomic pillow. What differentiates this from conventional pillows, is that it supports your head perfectly without forcing your neck to bend.

3.3 The Sofa

Most people usually opt for a soft sofa. You know, the kind that hugs you whenever you sink into it. It's more comfortable, right? That may seem like something you want in your living room, but that comfortable feeling is also short-term.

With all that pressure from sitting and standing up, also come serious joint problems. To avoid that, the solution is simple and obvious - opt for an ergonomic sofa.

It may sound like something fancy and rather expensive, but ergonomic sofas can be quite affordable. Choose one that offers good support for your back and allows your feet to rest on the floor – or use a foot cushion instead.

If you don't like the idea of replacing your sofa because it is new or has sentimental value, all is not lost. You can achieve similar benefits with an orthopedic coccyx cushion that will reduce the pressure on your tailbone.

You may also choose a lumbar support cushion that will support your lower back. Combine both of them and even the most uncomfortable chair can be your new ergonomic sofa.

Tip: Do not get overly obsessed with ergonomic hardware. It may be beneficial, but what is more important is that you are mindful about your body, and organize your house in ways that your body will not be forced to constantly perform multi-action processes.

4. Workplace Ergonomics



Now we shall consider the environment where most of us spend the majority of our waking hours. The domain in which this discipline is most often related.

Whether you spend your work days in an office with a nice view, your crowded cubicle, or in front of a sock-making machine, chances are, in the beginning it took you a while to adapt to your job.

How did you adapt exactly? Uncomfortable positions, chattering noises and other nuisances that make your head pop and body ache, suddenly become something you no longer notice.

But if your work day ends with you returning home tired, cranky, not in the mood for anything and simply exhausted, then, without even knowing it, small minor discomforts could be destroying you from the inside.

Remember that small things combined and accumulated over time lead to something larger – again this can be in a positive or negative sense.

Although it must seem like adapting to your workplace is an inevitable part of every job, the truth is, it is the very opposite of what you should be doing.

Trying to get used to the anxious work atmosphere while accepting all of your office's discomfort will not only crush your productivity and deprive you from being a proficient worker, but it can also be hazardous to your health.

Instead of 'adapting' (which clearly means getting used to the distress, not easing it), why not take the ergonomic approach and let your workplace adapt to your needs?

Because that is what office ergonomics is all about, taking out the most important component in the workplace – you, and modifying the surroundings to provide you with a comfortable way to do your job efficiently.

4.1 Posture

If there is something that gives you cramps during work hours then there is every chance it is related to your adopted posture.

You might be surprised to learn how some simple changes in the way you sit can make you feel a lot better and improve your overall work mood.

And since most workplaces require sitting for long periods, it is of great importance for you to learn how to do it the right way; the ergonomic way that sets you up for a much more comfortable work experience – even if you think there is nothing wrong with the way you currently sit.

DID YOU KNOW?

Office workers in America spend an average of 6 hours per day at their desks. If you also consider time commuting, relaxing on the sofa and watching television, the average time spent sitting rises to 10 hours.

That is a lot of time spent sitting. No matter how ergonomic your workstation is and how good your posture - you should also remember that exercise and regular breaks are essential.

Posture at Your Workstation

- ◆ It is recommended to keep your eyes level with the top of your monitor. If you are not comfortable with this position, you can tilt your head downwards a little.
- ◆ Relax your shoulders.
- ◆ Keep your elbows at your sides, at a 90 degree angle.
- ◆ Your wrists should be kept straight while working. Do not let them slouch. Use a keyboard wrist rest and mouse pad if necessary.
- ◆ It is recommended for your knees to be at the same level as your hips, but again, if this is not comfortable for you, it is okay for you to keep them slightly below.
- ◆ Your feet should be supported at all times. If your chair height doesn't allow you to rest your feet on the floor, then it is crucial for you to have a footrest. And yes, until you get one, it is probably a good idea to put a couple of solid books on the floor that will keep your feet supported.

- ◆ Your back must be well supported by your chair. If you don't feel that your chair offers adequate back support then invest in a lumbar support cushion or coccyx cushion.

4.2 Chair

If you spend a good portion of your work time seated, then, simply put, you must have a chair that is comfortable and encourages good posture. If you go shopping for an ergonomic chair, you might be slightly overwhelmed by the variety of different options.

The prices and features vary, but spending a fortune does not necessarily mean buying the best. Instead, try to focus on the ergonomic features of the chair, and make sure to check the items on this list before you invest:

- ⇒ **Adjustable height.** The chair should have a lever for height adjustment and for most people, ideally it should be 16 – 21 inches from the floor.
- ⇒ **Wide seat.** Again, for most of us, our chairs should be 17-20 inches wide.

- ⇒ **Deep seat.** An ideal ergonomic office chair should leave 2-4 inches between the seat and the back of your knees, when you are seated with your back against the cushion.
- ⇒ **Lumbar support.** This is the most important feature in ergonomic chairs, so pay good attention while searching for the perfect match. The chair must have a lumbar adjustment so that the inward curve of your lower back has a suitable fit.
- ⇒ **Wide backrest.** 12-19 inches of a backrest width is recommended. The backrest should be also adjustable.
- ⇒ **Adjustable, comfortable armrests.**
- ⇒ **Rotating 5 caster base.**
- ⇒ **Breathable fabric material.**

If you (or your employer) can't afford a chair that ticks all of these boxes then don't despair. You can still improve your existing office chair and make it more ergonomic by simply providing a lumbar cushion for your back and getting a foot rest if your feet don't reach the floor.

If the armrests are hard or square shaped you can remove them or get some arm rest pads.

4.3 Desk

If you think that buying an ergonomic desk means paying through the nose by default, then think again. There are some pretty affordable options that offer all of the important features that you need from a desk.

Things such as ample space, easy reach drawers and adequate leg room are important. If you plan on going desk shopping, make sure to buy the one that will make you feel comfortable, not just the one that suits your carefully designed office.

The ideal office desk should be adjustable and offer the choice of standing, meaning that you can both sit and stand, while maintaining proper posture.

If you don't want to replace your desk then make sure you optimize the one you are currently using until you decide it is time for an upgrade.

If your desk is too high for you, raise your chair as much as you can and use a footrest to support your feet. If it is too low for you, you need to find a way to provide enough free space for your legs under the desk.

Try placing some sturdy things (like blocks) under its legs, to make it higher. Do not worry about how it may look. After all, your office appearance cannot possibly be more important than your health.

4.4 Computer

The key element in most offices is of course, the computer. And while your job may require that you use it constantly, it is important for you to ensure that you do it properly.

The Monitor

Your monitor should be placed in front of you. To check if the distance is right, stretch out your arm; it should be an arm's length away.

Tilt the top of the monitor by about 10-20 degrees. The top of the screen should be at your eye level.

For those of you who have two monitors, place them next to each other, and make sure not to leave a gap.

Mouse and Keyboard

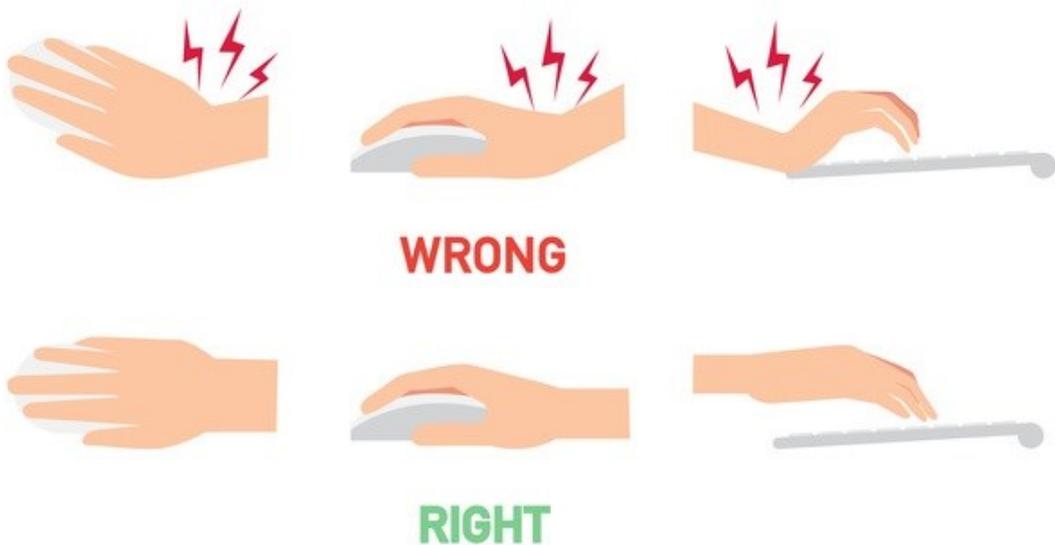
Simply placing the keyboard and mouse on your desk will not reward you with a healthy and productive work. It's not complicated, but there are certain rules associated with these two accessories.

The most important thing is that the mouse and keyboard should be as close to each other as possible. The alphanumeric part of your keyboard should, ideally, be centered on your desk, with the 'B' key directly in front of you.

It goes without saying that the use of keyboard rests and mouse pads is extremely important and beneficial, so make sure you have them on your desk.

Pay attention to how you use them as well. Your wrists should be straight, your hands just below your elbow level, and your upper arms should be kept close to your body.

How to Use Your Keyboard Wrist Rest Properly



4.5 Customized Area

Your work area should be customized, period. You need to avoid unnecessary body straining and ensure that the key objects you regularly use are always within reach.

So what is your reach zone? Sit down on your chair and move your hands and forearms, while keeping your elbows at your sides.

That is your easy reach zone.

Now, extend your arm full length, but be careful not to lean forward.

That is your maximum reach zone.

Anything out of your maximum reach zone is an unnecessary effort that is unfriendly to your body.

So go ahead and arrange the items you use regularly within your reach zone. Do not forget about heavy objects like manuals, or items that require some force, such as staplers.

5. Bad Ergonomics

You may look tough on the outside, but on the inside, everyone is just as fragile. Those of us who think that we are somehow immune to external environmental factors because we are strong, eat healthily and exercise are probably those who are the most vulnerable.

As we touched on at the start of this book there isn't nearly enough awareness about what good ergonomics is and why poor ergonomics is so bad for this.

Because of this lack of awareness we do not realize the dangers. Symptoms are often lacking or suppressed for some time, making it too late before the inevitable problems become apparent.

You have all no doubt heard the saying “prevention is better than cure.” This is never truer than dealing with how we interact with our environment.

Maybe you already have some signs that you haven't been looking after yourself as well as you could. Perhaps you have back pain, repetitive strain injuries, carpal tunnel syndrome, eye strain or something else.

If that is the case your body is giving you signals that you need to do something different. If you don't you will only exacerbate the problem. Please don't neglect your basic needs and sweep the uncomfortable signs that your body is sending you under the carpet. Seek professional medical advice if this is the case for you.

As we have established, ergonomics is the science that finds a balance between us and our surroundings, all with the purpose of increasing our performance level and our degree of comfort.

But what happens if we do as we please? What happens if we prefer to lie back with our feet on the desk instead of ensuring proper posture? Will this negligence catch up with us? Is ergonomics really that important?

Of course it is. By now it should be common sense that poor ergonomics can be perilous to your health. But how much impact does it really have?

Serious health problems can be developed simply by taking **bad posture**. And while we cannot retrieve years of contradicting our mothers and slouching down, it is never too late to straighten our backs and decrease our chances of:

- * Intestinal problems. While sitting with your shoulders hunched down, your digestive system is blocked because your intestines are folded.
- * Spider veins. Bad posture and prolonged sitting can increase the pressure in your legs, which can cause spider veins.
- * Poor circulation. Bad posture means bad circulation, which can affect your mood and increase your stress levels.
- * Reduced lung function. If you hunch down often, you reduce your lung capacity by 30%.

When your ergonomic environment is poor, your hands make repetitive actions, which means that they start to lack rest. Those forceful hand motions put too much pressure on the median nerve, which often results in **carpal tunnel syndrome**.

Just another reason why you should organize your keyboard and mouse the ergonomic way, today.

Repetitive strain injury is another risk that poor ergonomics carry. It is an injury to the musculoskeletal and nervous system, which can also be caused by repetitive actions, bad positions, mechanical compressions or vibrations.

Tennis elbow is another serious and very painful condition that may come as a result of bad ergonomics. Despite the name, you don't have to play tennis to get this condition.

It happens when your elbow tendons are overloaded, which usually happens due to a lot of repetitive movements, like working on a computer the non-ergonomic way.

Repetitive mouse clicking and typing on the keyboard and other repetitive finger movements may cause **trigger finger**. Trigger finger is also a painful joint condition.

6. Ergonomics Can Be Rewarding

Now that you understand how untreated ergonomic problems can result in some vexing joint problems, I assume that you have decided to actively engage an ergonomic lifestyle.

Smart decision. But before you go about transforming your home and workplace, let us say a few more things about what else ergonomics will bring to your life.

Besides the previously mentioned risks you will be alleviating by assuming good posture and taking the ergonomic approach, the benefits can be wide reaching.

- **Ultimate comfort.** Imagine a world where your back doesn't hurt after work hours, where you are in the mood for cooking even after a long and busy day, where you can comfortably watch your favorite show, where your neck doesn't hurt in the morning. Yes, ergonomics provides all that.

- **Increased productivity.** Obviously, when you are in a good mood and well refreshed, you are more productive. When it comes to workplace ergonomics, this is extremely beneficial as it can lead to further upturns at work.
- **You will save time.** If you organize your whole day ergonomically, you will suddenly find yourself enjoying more activities you thought you didn't have time for.
- **Improved quality of work.** Comfort and quality are usually tightly linked even if it doesn't seem so at first. Think about it, if you are not comfortable doing something, it will surely affect the outcome and its quality. And since good ergonomics provides comfort, we all know what that means, right?

7. Conclusion

It is our hope that this book has opened your eyes to the world of ergonomics – both good and bad. We encourage you to use this book as a starting point to make better choices and improve your life for the better.

Take some time to consider all of your environments and how you can make changes to improve them.

The key is to not get overwhelmed. You don't have to go out and replace your entire furniture and equipment. Tackle those areas that will give you the quickest return. That will help you to build momentum and carry this practice forward so that it becomes part of your new routines and habits.

Concentrate on one environment at a time. Make those changes, adjust as necessary and move on to the next. If you can make this a lifestyle change, a good one, you will only feel better.

Thank you for taking the time to read this eBook. We hope that you found it useful. We welcome your feedback to help us improve the book for new editions.

If you have any questions or comments about the topics discussed please get in touch with us through the contact form on our website or by sending an email to mail@ergonomicinnovations.com.

If you found this book beneficial then the greatest compliment you could give us is by sharing it with your friends and colleagues.

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